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FOR THE YEAR

1917

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NOTE.—Those whose names are printed in *italics* devote only a small portion of their time to work of the Nautical Almanac Office.

October, 1914.



PREFACE.

This volume of the *American Ephemeris and Nautical Almanac* was prepared under the immediate supervision of Professor W. S. EICHELBERGER, U. S. N., the Director. The character of the matter herein contained and its arrangement are the same as in the preceding volume.

This is the second volume to be issued under the international agreement resulting from the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911.

The naval appropriation bill approved August 22, 1912, contained the following:

The Secretary of the Navy is hereby authorized to arrange for the exchange of data with such foreign almanac offices as he may from time to time deem desirable, with a view to reducing the amount of duplication of work in preparing the different national nautical and astronomical almanacs and increasing the total data which may be of use to navigators and astronomers available for publication in the *American Ephemeris and Nautical Almanac*: *Provided*, That any such arrangement shall be terminable on one year's notice: *Provided further*, That the work of the Nautical Almanac Office during the continuance of any such arrangement shall be conducted so that in case of emergency the entire portion of the work intended for the use of navigators may be computed by the force employed by that office, and without any foreign cooperation whatsoever: *Provided further*, That any employee of the Nautical Almanac Office who may be authorized in any annual appropriation bill and whose services in whole or in part can be spared from the duty of preparing for publication the annual volumes of the *American Ephemeris and Nautical Almanac* may be employed by said office in the duty of improving the tables of the planets, moon, and stars, to be used in preparing for publication the annual volumes of the office: *Provided further*, That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

The volume, as in previous years, is divided into three parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives ephemerides of 825 stars, Sun, Moon, and major planets, for transit over the meridian of the Naval Observatory, Washington, which passes midway between the West and East Transit Circles of the Observatory. The mean places of the fixed stars and the data for their reduction are also included in Part II.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Greenwich mean time is used throughout this part except with the occultations visible at Washington where Washington time is used. Tables for the determination of latitude and azimuth from Polaris, tables for the conversion of time, and an alphabetical list of observatories, with their latitudes, longitudes, and other data, are contained in this part.

The Greenwich ephemerides of the Sun, Moon, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune were furnished by the office of the British *Nautical Almanac*.

The Greenwich ephemeris of Mercury, the elements of Saturn's rings, the elongations of Saturn's satellites, and the apparent places for Greenwich transit of 518 ten-day stars were furnished by the office of the *Berliner Jahrbuch*.

The conjunctions, phenomena, and configurations of Jupiter's satellites I-IV and the apparent places for Greenwich transit of 38 circumpolar stars were furnished by the office of the *Connaissance des Temps*.

The apparent places for Greenwich transit of 121 ten-day stars were furnished by the office of the *Almanaque Nautico*.

The apparent places for Greenwich transit of 137 ten-day stars were furnished by the office of the *Annuario Astronomico di Torino*.

In accordance with the recommendations of the *Congrès International des Éphémérides Astronomiques*, most of the material furnished from abroad is based upon tables prepared in the American Nautical Almanac Office. In the Introduction are mentioned the various tables upon which the different ephemerides are based.

The following computations were made by the American Nautical Almanac Office:

In Part I, all the hourly and daily variations for the quantities furnished from abroad except in the case of the right ascension and declination of the Moon.

In Part II, the quantities used in computing the apparent places of the stars from their mean places; the mean place list; the interpolation of the apparent places of 814 stars from transit at Greenwich

to transit at Washington; the apparent places of 11 stars; the interpolation of the ephemerides of the Sun, Moon, and planets from Greenwich noon to transit at Washington; the stellar magnitudes of the planets.

In Part III, the data relating to the eclipses of the Sun and Moon; the data relating to the occultations of stars by the Moon; the ephemerides for physical observations of the Sun, Moon, Mars, and Jupiter; the elements of the illuminated disks of Mercury and Venus; the stellar magnitudes of the planets; the data concerning the satellites of Uranus, Neptune, the fifth, sixth, and seventh satellites of Jupiter, and the ninth satellite of Saturn; the diagrams of all the satellite orbits; the position angle and distance tables of the satellites of Saturn; the list of phenomena; the list of observatories with their geographical coordinates; and the tables for the determination of latitude and azimuth from observations of Polaris.

All computations made in the American Nautical Almanac Office and those received from the other offices were subjected to checks to insure absence of errors.

J. A. HOOGEWERFF,
Captain, U. S. Navy,
Superintendent Naval Observatory.

U. S. NAVAL OBSERVATORY, *October, 1914.*

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ERRATA.

The American Ephemeris, 1916.

Page.

141	Dec. 32, Var. per Hour of Right Ascension	for	+11°.878	read	+11°.874
743	Moon, Longitude, Mean, Page	for	118	read	611
743	Moon, Longitude, True, Page	for	611	read	118
744	Parallax, Horizontal, of Jupiter, Page	for	134, 538	read	174, 548

viii

INTRODUCTION.

The ephemeris of the Sun is constructed from NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8''.80, *Paris Conference, May, 1896*.

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox are computed by the formulæ—

$$\begin{aligned} \Delta X &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y &= -X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9.1 \tau R \sin (\lambda + 6^\circ) \\ \Delta Z &= -X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21.0 \tau R \sin (\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

R = the Sun's distance from the Earth,

λ = the Sun's true longitude,

β = the Sun's true latitude, expressed in seconds of arc,

ω = the obliquity of the ecliptic,

$\Delta \lambda$ = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,

$\Delta \omega$ = the reduction of the mean to the apparent obliquity,

τ = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from HANSEN'S *Tables de la Lune* (London, 1857), the mean longitude being corrected as in previous years, beginning with the volume for the year 1883. The statement concerning these corrections which is contained in the volumes from 1883 to 1911, inclusive, is erroneous, in that they have not been computed strictly in accordance with the formula in NEWCOMB'S *Researches on the Motion of the Moon*, part 1, page 268, *Washington Observations*, 1875, Appendix II. That formula is,

$$-1''.14 - 29''.17 T - 3''.86 T^2 - V, -0''.09 \sin A - 15''.49 \cos A,$$

while the expression actually used is,

$$-1''.14 - 29''.17 T - 3''.76 T^2 - V, -15''.49 \cos A.$$

In these formulæ T is the time in units of 100 years reckoned from 1800.

The ephemerides of Mercury, Venus, and Mars are derived from NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1. The formulæ from which this nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{array}{ll} \delta\phi = -(17''.234 + 0''.017 T) \sin \Omega & \delta\epsilon = +9''.214 \cos \Omega \\ + 0''.209 \sin 2 \Omega & -0''.090 \cos 2 \Omega \\ - 1''.257 \sin 2 L & +0''.546 \cos 2 L \\ - 0''.049 \sin (3 L + 78^\circ.7) & +0''.021 \cos (3 L + 78^\circ.7) \\ + 0''.110 \sin (L + 75^\circ.3) & -0''.009 \cos (L - 78^\circ.7) \end{array}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers are as follows:

Terms of Long Period.	Terms of Short Period.
$\delta\phi = -(17''.234 + 0''.017 T) \sin \Omega$	$-0''.204 \sin 2 \zeta$
$+ 0''.209 \sin 2 \Omega$	$+0''.011 \sin (\zeta + \Gamma')$
$- 1''.272 \sin 2 L$	$+0''.068 \sin (\zeta - \Gamma')$
$+ 0''.128 \sin (L - \Gamma)$	$-0''.034 \sin (2 \zeta - \Omega)$
$- 0''.050 \sin (3 L - \Gamma)$	$-0''.028 \sin (3 \zeta - \Gamma')$
$+ 0''.021 \sin (L + \Gamma)$	$+0''.015 \sin (\zeta - 2 L + \Gamma')$
$+ 0''.012 \sin (2 L - \Omega)$	$+0''.006 \sin 2 (\zeta - L)$
$\delta\epsilon = + (9''.210 + 0''.0009 T) \cos \Omega$	$+0''.088 \cos 2 \zeta$
$- 0''.090 \cos 2 \Omega$	$+0''.018 \cos (2 \zeta - \Omega)$
$+ 0''.551 \cos 2 L$	$+0''.011 \cos (3 \zeta - \Gamma')$
$+ 0''.022 \cos (3 L - \Gamma)$	$-0''.005 \cos (\zeta + \Gamma')$
$- 0''.009 \cos (L + \Gamma)$	
$- 0''.007 \cos (2 L - \Omega)$	

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars are explained on pages 200 and 201. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from NEWCOMB'S *Catalogue of Fundamental Stars, Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2.

In general, the names of the stars are the same as in NEWCOMB'S Suggested List of Fundamental Stars, except that the FLAMSTEED number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of HEIS or GOULD have been used. In all such cases, H¹ or the letter G precedes the constellation name, as, for example, 5 H¹. Cassiopeiæ and 38 G. Horologii.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

The spectral classification has been furnished by the Harvard College Observatory. The notation is that of *Annals of Harvard College Observatory*, Vol. LVI.

The mean places, annual variations, and annual proper motions of the stars have been taken from NEWCOMB'S Catalogue, except that those of ϵ Hydri, 38 G. Horologii, and π Centauri have been taken from *Veröffentlichungen des Königlich Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33.

The values of $\Delta\alpha$ and $\Delta\delta$ which are given for the companions to the stars γ Andromedæ, α^1 Crucis, ζ^1 Ursæ Majoris and 61 Cygni, have been taken from BOSS'S *Preliminary General Catalogue*, and those for α^2 Geminorum from DOBERCK'S elements given in the *Astronomische Nachrichten*, 1904, vol. 166, page 145.

The formulæ for the computation of the Besselian and Independent Star Numbers are given on page 200, the coefficients being those given by NEWCOMB in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation, depending on the Moon's mean longitude, have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides are corrected for the effect of these short-period terms is given on page 201.

According to the formulæ on pages 200 and 201 the star constants $a, b, c, d, a', b', c', d'$ are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha - \alpha_s$	To $\delta - \delta_s$
$\begin{aligned} &+0.000\ 003\ r^2 \sin \alpha \Big\} \tan \delta \\ &-0.000\ 149\ r^2 \cos \alpha \Big\} \\ &-0.000\ 0650\ r^2 \sin 2\alpha \Big\} \tan^2 \delta \\ &+0.000\ 0103 \sin 2\ \odot \cos 2\alpha \Big\} \\ &-0.000\ 0107 \cos 2\ \odot \sin 2\alpha \Big\} \tan^2 \delta \\ &+0.000\ 0620 \sin 2\ \odot \cos 2\alpha \Big\} \sec^2 \delta \\ &-0.000\ 0622 \cos 2\ \odot \sin 2\alpha \Big\} \sec^2 \delta \\ &+0.000\ 0513 \sin (\odot + \odot_s) \cos 2\alpha \Big\} \tan \delta \sec \delta \\ &-0.000\ 0507 \cos (\odot + \odot_s) \sin 2\alpha \Big\} \\ &+0.000\ 0097 \sin (\odot - \odot_s) \cos 2\alpha \Big\} \tan \delta \sec \delta \\ &-0.000\ 0053 \cos (\odot - \odot_s) \sin 2\alpha \Big\} \tan \delta \sec \delta \end{aligned}$	$\begin{aligned} &+0.000\ 975\ r^2 \sin^2 \alpha \Big\} \\ &-0.000\ 023 \cos 2\ \odot_s \Big\} \\ &-0.000\ 080 \cos 2\ \odot_s \cos 2\alpha \Big\} \tan \delta \\ &-0.000\ 077 \sin 2\ \odot_s \sin 2\alpha \Big\} \tan \delta \\ &+0.000\ 040 \cos 2\ \odot \Big\} \\ &-0.000\ 467 \cos 2\ \odot \cos 2\alpha \Big\} \\ &-0.000\ 465 \sin 2\ \odot \sin 2\alpha \Big\} \\ &-0.000\ 039 \cos (\odot + \odot_s) \Big\} \\ &-0.000\ 380 \cos (\odot + \odot_s) \cos 2\alpha \Big\} \sin \delta \tan \delta \\ &-0.000\ 385 \sin (\odot + \odot_s) \sin 2\alpha \Big\} \\ &-0.000\ 380 \cos (\odot - \odot_s) \Big\} \\ &-0.000\ 040 \cos (\odot - \odot_s) \cos 2\alpha \Big\} \\ &-0.000\ 072 \sin (\odot - \odot_s) \sin 2\alpha \Big\} \sin \delta \tan \delta \end{aligned}$

These terms are negligible for stars whose declination is numerically less than 80° , but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of seven stars have been corrected for the effect of annual parallax. These stars, with the adopted values of the annual parallax, are—

r Ceti	0.31	α Centauri	0.75
ϵ Eridani	0.32	α Aquilæ (Altair) . .	0.23
α Canis Majoris (Sirius) . .	0.38	61 Cygni	0.30
α Canis Minoris (Procyon) . .	0.33		

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri have been corrected for the effect of orbital motion. . AUWERS'S :

elements were used for Sirius and Procyon, and **SMITH'S** elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veröffentlichungen des Königlich Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from **NEWCOMB'S** Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the *Star List of the American Ephemeris* [Supplement to the *American Ephemeris and Nautical Almanac*] for 1910 and 1911, and in the *American Ephemeris and Nautical Almanac* for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1917.0	1918.0	1917.0	1918.0	1917.0	1918.0
$\Delta\alpha$	-0°.143	-0°.143	-0°.062	-0°.061	+0°.647	+0°.634
$\Delta\delta$	-0''.59	-0''.72	+0''.05	+0''.18	+5''.98	+5''.70

These corrections have not been applied to the mean places as published in this volume.

The stars occulted by the Moon have been selected from the *Catalogue of Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places for 1917.0 have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with **BESSEL'S** method, the special forms employed being a modification of those developed in **CHAUVENET'S** *Spherical and Practical Astronomy*.

In the computation of the elements of Eclipses, the following corrections to the longitude, latitude, and parallax of the Moon, deduced by **NEWCOMB** from recent observations of occultations of stars by the Moon, *Astronomical Papers of the American Ephemeris*, Vol. IX, part 1, have been applied. These corrections have been assumed in each case to be constant during the eclipse.

G. M. T.	$\delta\alpha$	$\delta\delta$	$\delta\pi$
1917	"	"	"
Jan. 7 ^d 20 ^h	+8.4	+1.3	+0.40
Jan. 22 20	+7.6	0.0	+0.50
June 19 1	+6.3	+1.3	+0.43
July 4 10	+7.0	0.0	+0.48
July 18 15	+6.6	+1.6	+0.41
Dec. 13 21	+7.5	-0.1	+0.46
Dec. 27 22	+7.8	+1.4	+0.44

The elongations of the satellites of Mars are derived from elements given by **H. STRUVE** in *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The conjunctions and phenomena of Jupiter's four brighter satellites are derived from **SAMPSON'S** tables. The configurations are derived from a continuation of **DAMOISEAU'S** tables by **M. PORTIER**.

The elongations of the Vth satellite of Jupiter are derived from unpublished elements deduced from the observations of **BARNARD**.

The differential coordinates of Jupiter's VIth and VIIth satellites are derived from elements and tables given in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The positions of the rings and the elongations and conjunctions of the satellites of Saturn are derived from elements given by H. STRUVE in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; with corrections communicated by H. STRUVE to the *Berliner Jahrbuch*. The differential coordinates of Phœbe are derived from elements and tables given in *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent outer dimensions (a and b) of the rings of Saturn are also according to STRUVE; the relative dimensions of the rings are computed from BESSEL's data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of Ariel and Umbriel, the inner satellites of Uranus, are derived from the data of NEWCOMB's *Uranian and Neptunian Systems*, *Washington Observations*, 1873, Appendix I. The elongations of Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. STRUVE in *Abhandlungen der K. Preussischen Akademie der Wissenschaften*, 1912.

The elongations of the satellite of Neptune are derived from elements given by A. HALL in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is $16' 1''.50$, while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., $15' 59''.63$.

In the computation of the ephemeris for physical observations of the Sun the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	$7^{\circ} 15'$
Longitude of the ascending node of the Sun's equator on the ecliptic	$73^{\circ} 40' + 50''.25 (t-1850)$
Sidereal period of rotation (mean solar days)	$25^d.48$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π , by the formula,

$$S = 0.272\ 506\ \pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by J. PETERS in the *Astronomische Nachrichten*, 1895, Vol. 138, page 147; and the constant $1''.50$ is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$\sin S = 0.272\ 274\ \sin \pi$$

In the computation of the ephemeris for physical observations of the Moon, the following notation and formulæ have been used, the value of I and the formulæ for physical libration being those given by F. HAYN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907:

I = the inclination of the Moon's mean equator to the ecliptic ($= 1^{\circ} 32'.1$),

Ω = the longitude of the ascending node of the Moon's orbit, or the longitude of the descending node of the Moon's mean equator,

C = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east,

$\lambda, \beta, \alpha, \delta$ = the geocentric longitude, latitude, right ascension, and declination of the Moon,

i = the inclination of the Moon's mean equator to the Earth's true equator,
 d = the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic,
 Ω = the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator,
 C = the Moon's mean longitude, referred to the mean equinox,
 g' = the Earth's mean anomaly,
 g = the Moon's mean anomaly,
 ω = the angular distance of the perigee of the Moon's orbit from its ascending node on the ecliptic,
 b, l = the optical librations in latitude and longitude, respectively,
 $\delta b, \delta l$ = the physical librations in latitude and longitude, respectively,
 $b + \delta b$ = the Moon's geocentric libration in latitude = the Earth's selenographic latitude,
 $l + \delta l$ = the Moon's geocentric libration in longitude = the Earth's selenographic longitude,
 δC = the physical libration of C ,
 $\mu = -0'.617 \sin 2(\Omega - l)$,
 $A = \sin I \cos(\Omega - l)$,
 $\tan B = \tan I \sin(\Omega - l)$,
 $\lambda' = \lambda + \mu + Ab$,
 $b = B - \beta$,
 $l = \lambda' - C$,
 $\sin C' = \sin i \frac{\cos(\lambda' + d - \Omega)}{\cos \delta} = -\sin i \frac{\cos(\alpha - \Omega)}{\cos b}$,
 $\delta b = +108'' \sin(\omega + l) + 37'' \sin(\omega - l) - 11'' \sin(g + \omega - l)$,
 $\delta l = +12'' \sin g - 59'' \sin g' - 18'' \sin 2\omega$,
 $-[108'' \cos(\omega + l) - 37'' \cos(\omega - l) + 11'' \cos(g + \omega - l)] \tan b$,
 $\delta C = -[108'' \cos(\omega + l) - 37'' \cos(\omega - l) + 11'' \cos(g + \omega - l)] \sec b$,
 $C = C' + \delta C$.

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars	. . . . .	$\alpha = 21^h 10^m 0^s + 1^s.565(t-1905)$ $\delta = 54^\circ 30' 0'' + 12''.60(t-1905)$
Position of north pole of Jupiter	. . . . .	$\alpha = 17^h 52^m 0^s.84 + 0^s.247(t-1910)$ $\delta = 64^\circ 33' 34''.6 - 0''.60(t-1910)$
Rotation period of Mars	. . . . .	$24^h 37^m 22^s.65$
Rotation period of Jupiter	{ System I. System II.	$9^h 50^m 30^s.004$ $9^h 55^m 40^s.632$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon	. . . . .	$52^\circ.01$
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon	. . . . .	$47^\circ.31$
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon	. . . . .	$96^\circ.58$

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395-403 and 517-524). The longitude of the Great Red Spot and the time of its transit across the Central Meridian given in the volumes for 1913 and 1914

have been replaced by those of System II. of MARTH. This change has been made in view of the following facts: The Paris Conference of October, 1911, assigned to the office of the American Ephemeris and Nautical Almanac the preparation of the ephemerides for the physical observations of the planets; a general desire exists that the use of System II. of MARTH should not be discontinued; and the position of the Great Red Spot during the opposition of 1912 was about 70° from the place predicted from the elements adopted in the *American Ephemeris and Nautical Almanac* for 1913.

The adopted semidiameters of the planets, with the authority for each, are given on page xix. Their stellar magnitudes have been computed from formulæ given by G. MUELLER in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories the authority for the various positions is given in each case. The latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ , are computed from the formulæ on page xviii, using the flattening $\frac{1}{297}$ obtained by JOHN F. HAYFORD in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the Paris Conference, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1917.

New Year's Day	Monday,	Jan.	1.
Epiphany	Saturday,	Jan.	6.
Septuagesima Sunday	Sunday,	Feb.	4.
Lincoln's Birthday	Monday,	Feb.	12.
Quinquagesima (Shrove Sunday)	Sunday,	Feb.	18.
Ash Wednesday	Wednesday,	Feb.	21.
Washington's Birthday	Thursday,	Feb.	22.
Palm Sunday	Sunday,	Apr.	1.
Good Friday	Friday,	Apr.	6.
First Day of Passover	Saturday,	Apr.	7.
Easter Sunday	Sunday,	Apr.	8.
Rogation Sunday	Sunday,	May	13.
Ascension Day (Holy Thursday)	Thursday,	May	17.
Hebrew Pentecost (Shebuoth)	Sunday,	May	27.
Pentecost (Whit Sunday)	Sunday,	May	27.
Memorial Day	Wednesday,	May	30.
Trinity Sunday	Sunday,	June	3.
Corpus Christi	Thursday,	June	7.
Independence Day	Wednesday,	July	4.
Labor Day (except in certain States)	Monday,	Sept.	3.
Hebrew New Year (Rosh Hashanah)	Monday,	Sept.	17.
Day of Atonement (Yom Kippur)	Wednesday,	Sept.	26.
First Day of Tabernacle (Sucoth)	Monday,	Oct.	1.
Election Day (in certain States)	Tuesday,	Nov.	6.
Thanksgiving Day	Thursday,	Nov.	29.
First Sunday in Advent	Sunday,	Dec.	2.
Christmas Day	Tuesday,	Dec.	25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1917, WHICH COMPRISES THE LATTER PART OF THE 141ST AND THE BEGINNING OF THE 142D YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6630 of the Julian period;

- “ 7425–7426 of the Byzantine era, the year 7426 commencing on September 1;
- “ 5677–5678 of the Jewish era, the year 5678 commencing on September 17, or, more exactly, at sunset on September 16;
- “ 2670 since the foundation of Rome, according to VARRO;
- “ 2664 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
- “ 2693 of the Olympiads, or the first year of the 674th Olympiad, commencing in July, 1917, if we fix the era of the Olympiads at $775\frac{1}{2}$ years before CHRIST, or near the beginning of July of the year 3938 of the Julian period;
- “ 2229 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, $-311 = \text{B. C. } 312, = 4402$ of the Julian period;
- “ 1633 of the era of DIOCLETIAN;
- “ 2577 of the Japanese era and to the 6th year of the period entitled Taisho.

The year 1336 of the Mohammedan era, or the era of the Hegira, begins on the 17th day of October, 1917.

The first day of January of the year 1917 is the 2,421,230th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	G	Solar Cycle	22
Epact	6	Roman Indiction.. . . .	15
Lunar Cycle or Golden Number	18	Julian Period	6630

39398°—1917—II

xvii

ASTRONOMICAL CONSTANTS.

Solar Parallax	8.80	} Paris Conference.
Constant of Nutation	9.21	
Constant of Aberration	20.47	
General Precession	50".2564+0".000 222(<i>t</i> -1900)	} Newcomb.
Obliquity of the Ecliptic	23° 27' 8".26-0".4684(<i>t</i> -1900)	
Equatorial Horizontal Parallax of the Moon	57' 2".63*	(Newcomb)

Mean distance Earth to Moon 384 411 kilometers=238 862 miles, or 60.2678 radii.

Mean distance Earth to Sun 149 504 201 kilometers=92 897 416 statute miles.

Velocity of light 299 860 kilometers=186 324 statute miles per second (Newcomb and Michelson).

Light travels unit distance in 498".580.

Gaussian Gravitation Constant, $\gamma k=0.017\ 202\ 099=3\ 548''.187\ 61$.

Acceleration in one second due to gravity, $g=9.8060-\frac{m}{R}0.0260\cos 2\varphi-\frac{2h}{R}g.\ddagger$ }
 Length of seconds pendulum, $l=0.993\ 549-\frac{m}{R}0.002\ 631\cos 2\varphi-\frac{2h}{R}l.\ddagger$ } Helmert.

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Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, $a=6378.388$ kilometers or 3963.34 statute miles.

Polar Radius, $b=6356.909$ " or 3949.99 " "

Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a}=\log e=8.913\ 804$

Logarithm radius= $\log \rho=9.999\ 2695+0.000\ 7324\cos 2\varphi-0.000\ 0019\cos 4\varphi$.

Reduction from geographic latitude φ to geocentric latitude φ' ,
 $\varphi'-\varphi=-11' 35''.66\sin 2\varphi+1''.17\sin 4\varphi$.

1 meter=3.280 8333 feet. 1 foot=0.304 8006 meters.

1 statute mile=0.868 362 nautical or geographical miles.

1 nautical mile=1.151 594 statute miles.

* Used in the computation of eclipses. The parallax used in the computation of the ephemeris of the Moon contained in this volume is 57' 2".23 (Hansen).

† k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

‡ φ =latitude, h =elevation above sea level in meters, and $\log R=6.80416$.

NOTE.—The above values of $\log \rho$ and $\varphi'-\varphi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly $\frac{1}{297}$.

ASTRONOMICAL CONSTANTS.

SEMI-DIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At Unit Distance.	At Mean Least Distance.	In Kilometers.	In Statute Miles.	Authority.
Sun	15 59.63	. . .	685 553.46	422 196.01	Auwers.
Moon	15 32.58*	. . .	1 738.02	1 079.96	Newcomb.
Mercury	3.34	5.45	2 420.89	1 504.27	Le Verrier.
Venus	8.55	30.90	6 197.18	3 850.74	Peirce.
Mars	5.05	9.64	3 660.32	2 274.42	Peirce.
Jupiter (Equatorial)	1 40.20	23.84	72 626.64	45 128.01	Am. Eph.
Jupiter (Polar)	1 34.12	22.40	68 219.76	42 389.71	Peirce.
Saturn (Equatorial)	1 24.88	9.94	61 522.45	38 228.20	Barnard.
Saturn (Polar)	1 17.47	9.07	56 151.56	34 890.89	Barnard.
Uranus	33.52	1.84	24 295.86	15 096.72	Am. Eph.
Neptune	38.66	1.33	28 021.42	17 411.67	Am. Eph.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH 1917—January 0^d G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6177
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8126
⊕ Earth	1.000 000	1.000 04	3 548.193	. . .	0.016 7439
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3244
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3653
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8310
♅ Uranus	19.190 978	84.015 29	42.23	1.012 00	0.047 0922
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5441

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.
☿ Mercury	7 0 11.5	47 20 50.7	76 9 50.9	27 44 52.89	3.221 8487—10
♀ Venus	3 23 37.7	75 55 57.5	130 24 11.4	210 37 57.16	4.389 3398—10
⊕ Earth . . . . .	. . . . .	. . . . .	101 30 47.1	99 34 51.67	4.482 2896—10
♂ Mars	1 51 0.9	48 55 1.4	334 31 53.0	307 42 19.72	3.509 5499—10
♃ Jupiter	1 18 28.1	99 36 35.2	12 59 7.6	34 12 1.58	6.979 9082—10
♄ Saturn	2 29 29.8	112 55 54.7	91 25 18.3	114 33 12.34	6.455 7335—10
♅ Uranus	0 46 22.0	73 34 32.6	169 19 14.1	316 26 34.40	5.640 7528—10
♆ Neptune	1 46 39.4	130 51 56.8	43 54 15.2	122 24 2.19	5.705 5338—10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1917 by applying LE VERRIER'S variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

* At mean distance. See *Ast. Papers Am. Eph.*, Vol. IX, p. 39. For the values of the semidiameter used in this volume see page xiii.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	{	1.	♈	Aries.	Autumn Signs.	{	7.	♎	Libra.
		2.	♉	Taurus.			8.	♏	Scorpius.
		3.	♊	Gemini.			9.	♐	Sagittarius.
Summer Signs.	{	4.	♋	Cancer.	Winter Signs.	{	10.	♑	Capricornus.
		5.	♌	Leo.			11.	♒	Aquarius.
		6.	♍	Virgo.			12.	♓	Pisces.

ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing $\pm 90^\circ$ in Longitude or Right Ascension.
- ♌ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

♈	Ascending Node.	°	Degrees.
♏	Descending Node.	'	Minutes of Arc.
N.	North.	"	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Stidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Jan. 1	Mo	18 45 50.11	11.041	-23 1 56.7	+12.09	16 17.87	8.95	- 3 34.47	-1.184	18 42 15.64
2	Tu	18 50 14.92	11.026	22 56 52.8	13.23	16 17.88	8.95	4 2.72	1.170	18 46 12.20
3	We	18 54 39.37	11.011	22 51 21.6	14.37	16 17.88	8.95	4 30.61	1.154	18 50 8.75
4	Th	18 59 3.42	10.994	22 45 23.2	15.50	16 17.88	8.95	4 58.11	1.137	18 54 5.31
5	Fr	19 3 27.06	10.976	22 38 57.7	16.62	16 17.87	8.95	5 25.19	1.119	18 58 1.87
6	Sa	19 7 50.25	10.957	-22 32 5.4	+17.74	16 17.85	8.95	- 5 51.83	-1.100	19 1 58.43
7	Su	19 12 12.98	10.937	22 24 46.4	18.84	16 17.83	8.95	6 17.99	1.080	19 5 54.99
8	Mo	19 16 35.22	10.916	22 17 1.0	19.94	16 17.80	8.95	6 43.67	1.059	19 9 51.54
9	Tu	19 20 56.94	10.894	22 8 49.3	21.03	16 17.77	8.95	7 8.83	1.037	19 13 48.10
10	We	19 25 18.12	10.871	22 0 11.6	22.11	16 17.73	8.95	7 33.46	1.015	19 17 44.66
11	Th	19 29 38.75	10.848	-21 51 8.2	+23.18	16 17.68	8.95	- 7 57.53	-0.991	19 21 41.22
12	Fr	19 33 58.80	10.823	21 41 39.2	24.24	16 17.63	8.95	8 21.02	0.967	19 25 37.78
13	Sa	19 38 18.25	10.798	21 31 44.9	25.28	16 17.57	8.95	8 43.92	0.941	19 29 34.33
14	Su	19 42 37.09	10.772	21 21 25.7	26.32	16 17.51	8.95	9 6.20	0.915	19 33 30.89
15	Mo	19 46 55.30	10.745	21 10 41.7	27.34	16 17.44	8.95	9 27.85	0.888	19 37 27.45
16	Tu	19 51 12.85	10.717	-20 59 33.3	+28.35	16 17.36	8.95	- 9 48.84	-0.861	19 41 24.01
17	We	19 55 29.73	10.689	20 48 0.8	29.35	16 17.28	8.94	10 9.17	0.833	19 45 20.57
18	Th	19 59 45.93	10.660	20 36 4.4	30.34	16 17.20	8.94	10 28.81	0.804	19 49 17.12
19	Fr	20 4 1.42	10.631	20 23 44.6	31.31	16 17.11	8.94	10 47.75	0.774	19 53 13.68
20	Sa	20 8 16.20	10.601	20 11 1.7	32.27	16 17.02	8.94	11 5.97	0.744	19 57 10.24
21	Su	20 12 30.25	10.570	-19 57 55.9	+33.21	16 16.92	8.94	-11 23.45	-0.713	20 1 6.79
22	Mo	20 16 43.54	10.538	19 44 27.8	34.13	16 16.82	8.94	11 40.19	0.681	20 5 3.35
23	Tu	20 20 56.06	10.506	19 30 37.7	35.04	16 16.72	8.94	11 56.15	0.649	20 8 59.91
24	We	20 25 7.80	10.473	19 16 25.9	35.94	16 16.61	8.94	12 11.33	0.616	20 12 56.47
25	Th	20 29 18.74	10.439	19 1 52.9	36.81	16 16.51	8.94	12 25.72	0.583	20 16 53.02
26	Fr	20 33 23.87	10.405	-18 46 59.0	+37.67	16 16.39	8.94	-12 39.29	-0.549	20 20 49.58
27	Sa	20 37 38.18	10.371	18 31 44.7	38.51	16 16.28	8.94	12 52.05	0.514	20 24 46.14
28	Su	20 41 46.66	10.336	18 16 10.4	39.34	16 16.16	8.93	13 3.97	0.479	20 28 42.69
29	Mo	20 45 54.31	10.302	18 0 16.4	40.15	16 16.03	8.93	13 15.06	0.445	20 32 39.25
30	Tu	20 50 1.13	10.267	17 44 3.2	40.95	16 15.91	8.93	13 25.32	0.410	20 36 35.80
31	We	20 54 7.10	10.231	-17 27 31.1	+41.72	16 15.77	8.93	-13 34.74	-0.375	20 40 32.36
Feb. 1	Th	20 58 12.23	10.195	17 10 40.7	42.48	16 15.64	8.93	13 43.32	0.340	20 44 28.92
2	Fr	21 2 16.53	10.162	16 53 32.2	43.23	16 15.49	8.93	13 51.06	0.305	20 48 25.47
3	Sa	21 6 20.00	10.127	16 36 6.0	43.95	16 15.35	8.93	13 57.97	0.271	20 52 22.03
4	Su	21 10 22.63	10.092	16 18 22.6	44.66	16 15.19	8.93	14 4.05	0.236	20 56 18.58
5	Mo	21 14 24.44	10.058	-16 0 22.3	+45.36	16 15.03	8.92	-14 9.31	-0.202	21 0 15.14
6	Tu	21 18 25.44	10.025	15 42 5.6	46.03	16 14.87	8.92	14 13.75	0.168	21 4 11.70
7	We	21 22 25.63	9.991	15 23 32.8	46.70	16 14.70	8.92	14 17.38	0.135	21 8 8.25
8	Th	21 26 25.02	9.958	15 4 44.3	47.34	16 14.53	8.92	14 20.21	0.101	21 12 4.81
9	Fr	21 30 23.61	9.925	14 45 40.5	47.97	16 14.35	8.92	14 22.25	0.069	21 16 1.36
10	Sa	21 34 21.43	9.893	-14 26 21.8	+48.58	16 14.16	8.92	-14 23.51	-0.036	21 19 57.92
11	Su	21 38 18.48	9.861	14 6 48.7	49.18	16 13.98	8.91	14 24.00	-0.004	21 23 54.47
12	Mo	21 42 14.76	9.829	13 47 1.5	49.76	16 13.79	8.91	14 23.73	+0.027	21 27 51.03
13	Tu	21 46 10.30	9.799	13 27 0.5	50.32	16 13.59	8.91	14 22.72	0.058	21 31 47.58
14	We	21 50 5.11	9.769	13 6 46.3	50.86	16 13.39	8.91	14 20.97	0.088	21 35 44.14
15	Th	21 53 59.20	9.739	-12 46 19.2	+51.39	16 13.18	8.91	-14 18.50	+0.118	21 39 40.69
16	Fr	21 57 52.57	9.709	-12 25 39.6	+51.90	16 12.97	8.90	-14 15.32	+0.147	21 43 37.25

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Preo. in Long.	Nut. in Long.	Aberation.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 27'	h m s
Jan.	1	280 32 24.7	152.89	+0.63	9.992 6701	- 2.0	0.06	+16.48	20.81	3.04	5 16 52.31
	2	281 33 34.0	152.88	0.62	9.992 6664	- 1.0	0.22	16.53	20.81	3.04	5 12 56.40
	3	282 34 43.0	152.87	0.57	9.992 6652	0.0	0.36	16.58	20.81	3.03	5 9 0.48
	4	283 35 51.7	152.86	0.50	9.992 6666	+ 1.1	0.49	16.63	20.81	3.03	5 5 4.57
	5	284 37 0.2	152.85	0.41	9.992 6707	2.3	0.63	16.68	20.81	3.04	5 1 8.66
	6	285 38 8.4	152.84	+0.30	9.992 6776	+ 3.8	0.77	+16.72	20.81	3.04	4 57 12.75
	7	286 39 16.3	152.83	0.18	9.992 6873	4.6	0.90	16.77	20.81	3.04	4 53 16.84
	8	287 40 24.1	152.82	+0.05	9.992 6997	5.7	1.04	16.82	20.81	3.04	4 49 20.92
	9	288 41 31.6	152.81	-0.07	9.992 7149	6.9	1.18	16.86	20.81	3.04	4 45 25.01
	10	289 42 38.9	152.80	0.20	9.992 7329	8.1	1.32	16.91	20.81	3.04	4 41 29.10
	11	290 43 45.9	152.79	-0.31	9.992 7536	+ 9.2	1.45	+16.95	20.81	3.05	4 37 33.19
	12	291 44 52.8	152.78	0.41	9.992 7770	10.3	1.59	16.99	20.81	3.05	4 33 37.28
	13	292 45 59.5	152.78	0.48	9.992 8030	11.4	1.73	17.03	20.81	3.05	4 29 41.36
	14	293 47 6.0	152.77	0.52	9.992 8315	12.4	1.87	17.07	20.80	3.06	4 25 45.45
	15	294 48 12.3	152.76	0.54	9.992 8624	13.4	2.00	17.11	20.80	3.07	4 21 49.54
	16	295 49 18.3	152.75	-0.53	9.992 8957	+14.3	2.14	+17.15	20.80	3.07	4 17 53.63
	17	296 50 24.1	152.74	0.49	9.992 9311	15.2	2.28	17.18	20.80	3.08	4 13 57.72
	18	297 51 29.7	152.72	0.42	9.992 9686	16.0	2.42	17.22	20.80	3.09	4 10 1.81
	19	298 52 34.9	152.71	0.32	9.993 0080	16.8	2.55	17.25	20.80	3.09	4 6 5.89
	20	299 53 39.7	152.69	0.20	9.993 0492	17.5	2.69	17.28	20.79	3.10	4 2 9.98
	21	300 54 44.0	152.67	-0.07	9.993 0919	+18.1	2.83	+17.31	20.79	3.11	3 58 14.07
	22	301 55 47.8	152.64	+0.06	9.993 1362	18.7	2.97	17.34	20.79	3.12	3 54 18.16
	23	302 56 50.9	152.61	0.20	9.993 1818	19.3	3.10	17.37	20.79	3.12	3 50 22.25
	24	303 57 53.2	152.58	0.33	9.993 2288	19.9	3.24	17.40	20.79	3.13	3 46 26.34
	25	304 58 54.5	152.53	0.44	9.993 2772	20.5	3.38	17.42	20.78	3.14	3 42 30.43
	26	305 59 54.8	152.49	+0.54	9.993 3271	+21.1	3.52	+17.44	20.78	3.15	3 38 34.52
	27	307 0 54.1	152.44	0.60	9.993 3786	21.8	3.66	17.46	20.78	3.16	3 34 38.60
	28	308 1 52.1	152.39	0.63	9.993 4318	22.5	3.79	17.48	20.78	3.17	3 30 42.69
	29	309 2 48.9	152.34	0.63	9.993 4867	23.3	3.93	17.50	20.77	3.18	3 26 46.78
	30	310 3 44.4	152.28	0.61	9.993 5435	24.1	4.07	17.52	20.77	3.19	3 22 50.87
	31	311 4 38.6	152.23	+0.55	9.993 6024	+25.0	4.21	+17.53	20.77	3.20	3 18 54.96
Feb.	1	312 5 31.4	152.18	0.46	9.993 6634	25.9	4.34	17.55	20.77	3.21	3 14 59.05
	2	313 6 23.0	152.12	0.35	9.993 7266	26.8	4.48	17.56	20.76	3.22	3 11 3.14
	3	314 7 13.2	152.06	0.24	9.993 7920	27.7	4.62	17.57	20.76	3.23	3 7 7.23
	4	315 8 2.0	152.01	+0.11	9.993 8598	28.7	4.76	17.58	20.76	3.24	3 3 11.32
	5	316 8 49.6	151.95	-0.02	9.993 9298	+29.7	4.89	+17.58	20.75	3.25	2 59 15.41
	6	317 9 35.9	151.90	0.14	9.994 0022	30.7	5.03	17.59	20.75	3.26	2 55 19.50
	7	318 10 20.9	151.85	0.26	9.994 0770	31.6	5.17	17.59	20.75	3.28	2 51 23.59
	8	319 11 4.6	151.80	0.36	9.994 1540	32.6	5.31	17.59	20.74	3.29	2 47 27.68
	9	320 11 47.1	151.75	0.44	9.994 2334	33.5	5.44	17.59	20.74	3.30	2 43 31.77
	10	321 12 28.4	151.70	-0.50	9.994 3149	+34.4	5.58	+17.59	20.73	3.30	2 39 35.86
	11	322 13 8.5	151.65	0.53	9.994 3986	35.3	5.72	17.59	20.73	3.31	2 35 39.95
	12	323 13 47.4	151.60	0.53	9.994 4844	36.1	5.86	17.58	20.73	3.32	2 31 44.05
	13	324 14 25.2	151.55	0.50	9.994 5721	36.9	5.99	17.58	20.72	3.33	2 27 48.14
	14	325 15 1.8	151.50	0.44	9.994 6617	37.7	6.13	17.57	20.72	3.34	2 23 52.23
	15	326 15 37.2	151.45	-0.34	9.994 7529	+38.3	6.27	+17.56	20.71	3.35	2 19 56.32
	16	327 16 11.4	151.40	-0.23	9.994 8457	+38.9	6.41	+17.55	20.71	3.36	2 16 0.41

SUN, 1917.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Feb. 16	Fr	21 57 52.57	9.709	-12 25 39.6	+51.90	16 12.97	8.90	-14 15.32	+0.147	21 43 37.25
17	Sa	22 1 45.24	9.680	12 4 48.0	52.40	16 12.76	8.90	14 11.44	0.176	21 47 33.81
18	Su	22 5 37.23	9.652	11 43 44.7	52.87	16 12.55	8.90	14 6.87	0.204	21 51 30.36
19	Mo	22 9 28.54	9.624	11 22 30.3	53.33	16 12.34	8.90	14 1.63	0.232	21 55 26.91
20	Tu	22 13 19.19	9.596	11 1 5.1	53.77	16 12.12	8.90	13 55.72	0.260	21 59 23.47
21	We	22 17 9.17	9.569	-10 39 29.7	+54.19	16 11.90	8.90	-13 49.15	+0.287	22 3 20.02
22	Th	22 20 58.51	9.543	10 17 44.3	54.59	16 11.68	8.89	13 41.94	0.314	22 7 16.57
23	Fr	22 24 47.22	9.516	9 55 49.5	54.97	16 11.46	8.89	13 34.09	0.340	22 11 13.13
24	Sa	22 28 35.29	9.490	9 33 45.8	55.33	16 11.24	8.89	13 25.61	0.366	22 15 9.68
25	Su	22 32 22.76	9.465	9 11 33.6	55.68	16 11.01	8.89	13 16.53	0.391	22 19 6.24
26	Mo	22 36 9.63	9.440	- 8 49 13.2	+56.01	16 10.78	8.88	-13 6.84	+0.416	22 23 2.79
27	Tu	22 39 55.91	9.416	8 26 45.1	56.33	16 10.55	8.88	12 56.57	0.440	22 26 59.34
28	We	22 43 41.63	9.393	8 4 9.6	56.62	16 10.32	8.88	12 45.73	0.463	22 30 55.90
Mar. 1	Th	22 47 26.80	9.371	7 41 27.3	56.90	16 10.09	8.88	12 34.34	0.485	22 34 52.45
2	Fr	22 51 11.43	9.349	7 18 38.4	57.17	16 9.85	8.88	12 22.43	0.507	22 38 49.01
3	Sa	22 54 55.56	9.328	- 6 55 43.4	+57.41	16 9.61	8.87	-12 10.00	+0.528	22 42 45.56
4	Su	22 58 39.19	9.306	6 32 42.7	57.64	16 9.37	8.87	11 57.06	0.548	22 46 42.11
5	Mo	23 2 22.36	9.289	6 9 36.6	57.86	16 9.13	8.87	11 43.69	0.567	22 50 38.67
6	Tu	23 6 5.07	9.271	5 46 25.4	58.06	16 8.88	8.87	11 29.86	0.586	22 54 35.22
7	We	23 9 47.36	9.254	5 23 9.6	58.25	16 8.63	8.87	11 15.59	0.603	22 58 31.77
8	Th	23 13 29.25	9.237	- 4 59 49.5	+58.42	16 8.38	8.86	-11 0.92	+0.619	23 2 28.33
9	Fr	23 17 10.75	9.221	4 36 25.5	58.58	16 8.12	8.86	10 45.87	0.635	23 6 24.88
10	Sa	23 20 51.89	9.207	4 12 58.0	58.72	16 7.86	8.86	10 30.45	0.660	23 10 21.43
11	Su	23 24 32.69	9.193	3 49 27.2	58.85	16 7.59	8.86	10 14.70	0.683	23 14 17.99
12	Mo	23 28 13.18	9.181	3 25 53.5	58.96	16 7.33	8.85	9 58.64	0.675	23 18 14.54
13	Tu	23 31 53.38	9.169	- 3 2 17.4	+59.05	16 7.06	8.85	- 9 42.29	+0.687	23 22 11.09
14	We	23 35 33.31	9.159	2 38 39.1	59.13	16 6.79	8.85	9 25.67	0.698	23 26 7.64
15	Th	23 39 13.00	9.149	2 14 59.1	59.20	16 6.52	8.85	9 8.90	0.708	23 30 4.20
16	Fr	23 42 52.46	9.140	1 51 17.7	59.25	16 6.24	8.84	8 51.71	0.716	23 34 0.75
17	Sa	23 46 31.73	9.132	1 27 35.2	59.29	16 5.97	8.84	8 34.42	0.724	23 37 57.30
18	Su	23 50 10.81	9.125	- 1 3 52.0	+59.31	16 5.69	8.84	- 8 16.95	+0.731	23 41 53.86
19	Mo	23 53 49.73	9.119	0 40 8.6	59.31	16 5.42	8.84	7 59.32	0.738	23 45 50.41
20	Tu	23 57 28.51	9.113	- 0 16 25.2	59.30	16 5.14	8.83	7 41.55	0.743	23 49 46.96
21	We	0 1 7.17	9.108	+ 0 7 17.6	59.27	16 4.86	8.83	7 23.65	0.748	23 53 43.52
22	Th	0 4 45.71	9.104	0 30 59.5	59.22	16 4.59	8.83	7 5.64	0.752	23 57 40.07
23	Fr	0 8 24.16	9.101	+ 0 54 40.2	+59.16	16 4.31	8.83	- 6 47.54	+0.756	0 1 36.62
24	Sa	0 12 2.54	9.098	1 18 19.2	59.09	16 4.04	8.82	6 29.36	0.759	0 5 33.17
25	Su	0 15 40.85	9.095	1 41 56.2	58.99	16 3.77	8.82	6 11.12	0.761	0 9 29.73
26	Mo	0 19 19.12	9.094	2 5 30.6	58.88	16 3.49	8.82	5 52.84	0.762	0 13 26.28
27	Tu	0 22 57.36	9.093	2 29 2.3	58.76	16 3.22	8.82	5 34.53	0.763	0 17 22.83
28	We	0 26 35.59	9.093	+ 2 52 30.8	+58.62	16 2.95	8.81	- 5 16.20	+0.763	0 21 19.39
29	Th	0 30 13.83	9.094	3 15 55.8	58.46	16 2.68	8.81	4 57.89	0.763	0 25 15.94
30	Fr	0 33 52.10	9.095	3 39 16.9	58.29	16 2.41	8.81	4 39.60	0.761	0 29 12.49
31	Sa	0 37 30.41	9.096	4 2 33.8	58.11	16 2.14	8.81	4 21.36	0.759	0 33 9.05
Apr. 1	Su	0 41 8.79	9.101	4 25 46.1	57.91	16 1.87	8.80	4 3.19	0.755	0 37 5.60
2	Mo	0 44 47.26	9.105	+ 4 48 53.5	+57.70	16 1.60	8.80	- 3 45.11	+0.751	0 41 2.15
3	Tu	0 48 25.83	9.110	+ 5 11 55.7	+57.48	16 1.32	8.80	- 3 27.13	+0.747	0 44 58.70

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Pres. in Long.	Nut. in Long.	Aber. ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" "	" "	" "			" "	" "	" "	23° 27'	h m s
Feb. 16	47	327 16 11.4	151.40	-0.28	9.994 8457	+33.9	6.41	+17.55	20.71	3.36	2 16 0.41
17	48	328 16 44.4	151.86	-0.10	9.994 9397	39.4	6.55	17.54	20.70	3.37	2 12 4.50
18	49	329 17 16.2	151.39	+0.04	9.995 0349	39.9	6.68	17.52	20.70	3.38	2 8 8.59
19	50	330 17 46.6	151.24	0.18	9.995 1311	40.3	6.82	17.51	20.70	3.39	2 4 12.68
20	51	331 18 15.5	151.18	0.31	9.995 2281	40.6	6.96	17.49	20.69	3.39	2 0 16.78
21	52	332 18 43.0	151.11	+0.42	9.995 3259	+40.9	7.10	+17.47	20.69	3.40	1 56 20.87
22	53	333 19 8.9	151.04	0.52	9.995 4244	41.2	7.23	17.45	20.68	3.41	1 52 24.96
23	54	334 19 33.0	150.97	0.59	9.995 5235	41.5	7.37	17.43	20.68	3.41	1 48 29.05
24	55	335 19 55.3	150.89	0.63	9.995 6234	41.8	7.51	17.41	20.67	3.42	1 44 33.14
25	56	336 20 15.8	150.81	0.63	9.995 7239	42.1	7.65	17.39	20.67	3.43	1 40 37.23
26	57	337 20 34.2	150.72	+0.60	9.995 8254	+42.5	7.78	+17.36	20.66	3.43	1 36 41.33
27	58	338 20 50.6	150.64	0.55	9.995 9278	42.9	7.92	17.34	20.66	3.44	1 32 45.42
28	59	339 21 5.0	150.56	0.47	9.996 0312	43.3	8.06	17.31	20.65	3.44	1 28 49.51
Mar. 1	60	340 21 17.4	150.47	0.36	9.996 1358	43.8	8.20	17.29	20.65	3.44	1 24 53.60
2	61	341 21 27.6	150.39	0.28	9.996 2415	44.3	8.33	17.26	20.64	3.44	1 20 57.69
3	62	342 21 35.9	150.30	+0.15	9.996 3486	+44.9	8.47	+17.23	20.64	3.45	1 17 1.79
4	63	343 21 42.0	150.21	+0.02	9.996 4569	45.4	8.61	17.20	20.63	3.45	1 13 5.88
5	64	344 21 46.2	150.13	-0.11	9.996 5667	45.9	8.75	17.17	20.63	3.45	1 9 9.97
6	65	345 21 48.3	150.05	0.22	9.996 6779	46.6	8.88	17.13	20.62	3.45	1 5 14.06
7	66	346 21 48.4	149.96	0.32	9.996 7904	47.2	9.02	17.10	20.62	3.45	1 1 18.16
8	67	347 21 46.5	149.88	-0.40	9.996 9044	+47.8	9.16	+17.07	20.61	3.45	0 57 22.25
9	68	348 21 42.7	149.80	0.46	9.997 0198	48.4	9.30	17.03	20.61	3.45	0 53 26.34
10	69	349 21 37.1	149.73	0.49	9.997 1365	48.9	9.43	17.00	20.60	3.45	0 49 30.44
11	70	350 21 29.6	149.65	0.49	9.997 2546	49.5	9.57	16.96	20.59	3.45	0 45 34.53
12	71	351 21 20.2	149.58	0.46	9.997 3740	50.0	9.71	16.92	20.59	3.44	0 41 38.62
13	72	352 21 9.2	149.50	-0.41	9.997 4946	+50.5	9.85	+16.89	20.58	3.44	0 37 42.71
14	73	353 20 56.3	149.43	0.33	9.997 6162	50.8	9.99	16.85	20.58	3.43	0 33 46.81
15	74	354 20 41.8	149.36	0.23	9.997 7386	51.2	10.12	16.81	20.57	3.43	0 29 50.90
16	75	355 20 25.6	149.29	-0.11	9.997 8619	51.5	10.26	16.77	20.57	3.42	0 25 54.99
17	76	356 20 7.8	149.23	+0.08	9.997 9857	51.7	10.40	16.74	20.56	3.42	0 21 59.09
18	77	357 19 48.2	149.15	+0.16	9.998 1099	+51.8	10.54	+16.70	20.55	3.41	0 18 3.18
19	78	358 19 26.9	149.08	0.29	9.998 2343	51.9	10.67	16.66	20.55	3.40	0 14 7.27
20	79	359 19 3.8	149.00	0.42	9.998 3588	51.8	10.81	16.62	20.54	3.39	0 10 11.36
21	80	0 18 39.0	148.92	0.52	9.998 4831	51.8	10.95	16.58	20.54	3.38	0 6 15.45
22	81	1 18 12.2	148.84	0.59	9.998 6072	51.7	11.09	16.54	20.53	3.37	0 2 19.55
23	82	2 17 43.4	148.76	+0.63	9.998 7310	+51.5	11.22	+16.50	20.52	3.36	23 54 27.73
24	83	3 17 12.6	148.67	0.64	9.998 8544	51.3	11.36	16.46	20.52	3.35	23 50 31.83
25	84	4 16 39.7	148.58	0.62	9.998 9774	51.2	11.50	16.43	20.51	3.34	23 46 35.92
26	85	5 13 4.6	148.49	0.57	9.999 1001	51.1	11.64	16.39	20.51	3.33	23 42 40.01
27	86	6 15 27.2	148.39	0.50	9.999 2226	51.0	11.77	16.35	20.50	3.32	23 38 44.11
28	87	7 14 47.5	148.31	+0.41	9.999 3450	+51.0	11.91	+16.31	20.50	3.30	23 34 48.20
29	88	8 14 5.5	148.21	0.30	9.999 4672	50.9	12.05	16.27	20.49	3.29	23 30 52.29
30	89	9 13 21.2	148.11	0.18	9.999 5894	51.0	12.19	16.24	20.48	3.27	23 26 56.38
31	90	10 12 34.6	148.01	+0.06	9.999 7118	51.0	12.32	16.20	20.48	3.26	23 23 0.48
Apr. 1	91	11 11 45.7	147.91	-0.06	9.999 8342	51.0	12.46	16.16	20.47	3.24	23 19 4.57
2	92	12 10 54.5	147.82	-0.17	9.999 9568	+51.1	12.60	+16.13	20.47	3.23	23 15 8.66
3	93	13 10 1.0	147.78	-0.27	0.000 0797	+51.2	12.74	+16.09	20.46	3.21	23 11 12.75

SUN, 1917.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time, App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.			
		h	m	s	s	°	'	"	"	'	"	m	s	h	m	s	
Apr.	1 Su	0	41	8.79	9.101	+ 4	25	46.1	+57.91	16	1.87	8.80	-4 3.19	+0.755	0	37	5.60
	2 Mo	0	44	47.26	9.105	4	48	53.5	57.70	16	1.60	8.80	3 45.11	0.751	0	41	2.15
	3 Tu	0	48	25.83	9.110	5	11	55.7	57.48	16	1.32	8.80	3 27.13	0.747	0	44	58.70
	4 We	0	52	4.54	9.116	5	34	52.4	57.24	16	1.05	8.80	3 9.28	0.741	0	48	55.26
	5 Th	0	55	43.39	9.122	5	57	43.1	56.99	16	0.78	8.79	2 51.58	0.734	0	52	51.81
	6 Fr	0	59	22.41	9.130	+ 6	20	27.7	+56.72	16	0.50	8.79	-2 34.05	+0.727	0	56	48.36
	7 Sa	1	3	1.63	9.138	6	43	5.7	56.44	16	0.23	8.79	2 16.71	0.718	1	0	44.92
	8 Su	1	6	41.05	9.147	7	5	36.9	56.15	15	59.96	8.79	1 59.58	0.709	1	4	41.47
	9 Mo	1	10	20.71	9.158	7	28	0.9	55.85	15	59.68	8.78	1 42.69	0.698	1	8	38.02
	10 Tu	1	14	0.63	9.169	7	50	17.4	55.53	15	59.40	8.78	1 26.06	0.688	1	12	34.58
	11 We	1	17	40.83	9.181	+ 8	12	26.1	+55.20	15	59.13	8.78	-1 9.69	+0.676	1	16	31.13
	12 Th	1	21	21.32	9.193	8	34	26.7	54.85	15	58.85	8.78	0 53.63	0.663	1	20	27.69
	13 Fr	1	25	2.12	9.207	8	56	18.8	54.49	15	58.57	8.77	0 37.88	0.649	1	24	24.24
	14 Sa	1	28	43.26	9.222	9	18	2.1	54.12	15	58.30	8.77	0 22.47	0.635	1	28	20.79
	15 Su	1	32	24.76	9.237	9	39	36.3	53.73	15	58.02	8.77	-0 7.41	0.620	1	32	17.35
	16 Mo	1	36	6.62	9.252	+10	1	1.0	+53.33	15	57.75	8.77	+0 7.28	+0.604	1	36	13.90
	17 Tu	1	39	48.87	9.268	10	22	16.9	52.91	15	57.48	8.76	0 21.59	0.588	1	40	10.46
	18 We	1	43	31.51	9.285	10	43	20.6	52.48	15	57.21	8.76	0 35.50	0.571	1	44	7.01
	19 Th	1	47	14.55	9.302	11	4	14.7	52.03	15	56.95	8.76	0 49.01	0.554	1	48	3.56
	20 Fr	1	50	58.02	9.320	11	24	57.9	51.57	15	56.68	8.76	1 2.10	0.537	1	52	0.12
	21 Sa	1	54	41.91	9.338	+11	45	29.9	+51.09	15	56.43	8.75	+1 14.76	+0.519	1	55	56.67
	22 Su	1	58	26.23	9.356	12	5	50.3	50.60	15	56.17	8.75	1 26.99	0.500	1	59	53.23
	23 Mo	2	2	11.00	9.375	12	25	58.6	50.09	15	55.91	8.75	1 38.78	0.482	2	3	49.78
	24 Tu	2	5	56.22	9.394	12	45	54.7	49.57	15	55.66	8.75	1 50.12	0.463	2	7	46.34
	25 We	2	9	41.90	9.413	13	5	38.1	49.04	15	55.41	8.74	2 0.99	0.443	2	11	42.89
	26 Th	2	13	28.04	9.432	+13	25	8.5	+48.49	15	55.17	8.74	+2 11.40	+0.424	2	15	39.45
	27 Fr	2	17	14.66	9.453	13	44	25.6	47.98	15	54.93	8.74	2 21.33	0.404	2	19	36.00
	28 Sa	2	21	1.77	9.473	14	8	29.1	47.36	15	54.69	8.74	2 30.78	0.384	2	23	32.55
	29 Su	2	24	49.37	9.494	14	22	18.7	46.77	15	54.45	8.74	2 39.74	0.363	2	27	29.11
	30 Mo	2	28	37.47	9.515	14	40	59.9	46.17	15	54.21	8.73	2 48.19	0.342	2	31	25.66
May	1 Tu	2	32	26.09	9.536	+14	59	14.6	+45.56	15	53.98	8.73	+2 56.13	+0.320	2	35	22.22
	2 We	2	36	15.22	9.558	15	17	20.5	44.93	15	53.75	8.73	3 3.55	0.298	2	39	18.77
	3 Th	2	40	4.88	9.580	15	35	11.2	44.29	15	53.51	8.73	3 10.45	0.276	2	43	15.33
	4 Fr	2	43	55.08	9.603	15	52	46.3	43.64	15	53.29	8.73	3 16.81	0.254	2	47	11.88
	5 Sa	2	47	45.82	9.626	16	10	5.8	42.97	15	53.06	8.72	3 22.62	0.231	2	51	8.44
	6 Su	2	51	37.11	9.649	+16	27	9.1	+42.30	15	52.83	8.72	+3 27.89	+0.208	2	55	5.00
	7 Mo	2	55	28.96	9.672	16	43	56.1	41.61	15	52.61	8.72	3 32.59	0.184	2	59	1.55
	8 Tu	2	59	21.38	9.696	17	0	26.4	40.91	15	52.39	8.72	3 36.73	0.160	3	2	58.11
	9 We	3	3	14.38	9.720	17	16	39.8	40.20	15	52.16	8.72	3 40.29	0.136	3	6	54.66
	10 Th	3	7	7.95	9.744	17	32	36.0	39.48	15	51.94	8.71	3 43.26	0.112	3	10	51.22
	11 Fr	3	11	2.12	9.769	+17	48	14.7	+38.74	15	51.73	8.71	+3 45.65	+0.087	3	14	47.77
	12 Sa	3	14	56.88	9.794	18	3	35.6	37.99	15	51.51	8.71	3 47.45	0.063	3	18	44.33
	13 Su	3	18	52.23	9.819	18	18	38.3	37.23	15	51.30	8.71	3 48.65	0.038	3	22	40.89
	14 Mo	3	22	48.18	9.844	18	33	22.7	36.46	15	51.09	8.71	3 49.26	+0.013	3	26	37.44
	15 Tu	3	26	44.72	9.868	18	47	48.4	35.68	15	50.88	8.70	3 49.27	-0.012	3	30	34.00
	16 We	3	30	41.85	9.893	+19	1	55.2	+34.88	15	50.68	8.70	+3 48.70	-0.036	3	34	30.56
	17 Th	3	34	39.57	9.917	+19	15	42.6	+34.07	15	50.48	8.70	+3 47.54	-0.060	3	38	27.11

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Pre. in Long.	Nut. in Long.	Aber. ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" "	" "	" "			" "	" "	" "	23° 27'	h m s
Apr. 1	91	11 11 45.7	147.91	-0.06	9.999 8342	+51.0	12.46	+16.16	20.47	3.24	23 19 4.57
2	92	12 10 54.5	147.82	0.17	9.999 9568	51.1	12.60	16.13	20.47	3.23	23 15 8.66
3	93	13 10 1.0	147.73	0.27	0.000 0797	51.2	12.74	16.09	20.46	3.21	23 11 12.75
4	94	14 9 5.3	147.63	0.35	0.000 2028	51.3	12.88	16.06	20.45	3.19	23 7 16.85
5	95	15 8 7.4	147.54	0.41	0.000 3262	51.5	13.01	16.02	20.45	3.17	23 3 20.94
6	96	16 7 7.4	147.46	-0.45	0.000 4500	+51.7	13.15	+15.99	20.44	3.15	22 59 25.03
7	97	17 6 5.3	147.37	0.46	0.000 5741	51.8	13.29	15.96	20.44	3.13	22 55 29.13
8	98	18 5 1.2	147.29	0.44	0.000 6985	51.9	13.43	15.93	20.43	3.11	22 51 33.22
9	99	19 3 55.1	147.21	0.39	0.000 8232	52.0	13.56	15.90	20.43	3.09	22 47 37.31
10	100	20 2 47.1	147.13	0.32	0.000 9482	52.1	13.70	15.87	20.42	3.07	22 43 41.40
11	101	21 1 37.3	147.05	-0.22	0.001 0734	+52.2	13.84	+15.84	20.41	3.05	22 39 45.50
12	102	22 0 25.6	146.98	-0.10	0.001 1985	52.1	13.98	15.81	20.41	3.03	22 35 49.59
13	103	22 59 12.3	146.91	+0.06	0.001 3235	52.0	14.11	15.78	20.40	3.00	22 31 53.68
14	104	23 57 57.8	146.84	0.16	0.001 4483	51.9	14.25	15.76	20.40	2.98	22 27 57.77
15	105	24 56 40.6	146.77	0.29	0.001 5727	51.7	14.39	15.73	20.39	2.96	22 24 1.86
16	106	25 55 22.3	146.70	+0.41	0.001 6963	+51.4	14.53	+15.71	20.38	2.93	22 20 5.96
17	107	26 54 2.3	146.63	0.51	0.001 8192	51.0	14.66	15.69	20.38	2.91	22 16 10.05
18	108	27 52 40.6	146.56	0.59	0.001 9412	50.6	14.80	15.67	20.37	2.89	22 12 14.14
19	109	28 51 17.2	146.49	0.63	0.002 0620	50.1	14.94	15.65	20.37	2.86	22 8 18.23
20	110	29 49 52.1	146.41	0.64	0.002 1815	49.5	15.08	15.63	20.37	2.83	22 4 22.32
21	111	30 48 25.1	146.34	+0.63	0.002 2997	+49.0	15.21	+15.61	20.36	2.81	22 0 26.42
22	112	31 46 56.2	146.26	0.59	0.002 4166	48.4	15.35	15.59	20.36	2.79	21 56 30.51
23	113	32 45 25.3	146.17	0.52	0.002 5320	47.8	15.49	15.58	20.35	2.76	21 52 34.60
24	114	33 43 52.5	146.09	0.42	0.002 6461	47.3	15.63	15.56	20.35	2.73	21 48 38.69
25	115	34 42 17.6	146.01	0.30	0.002 7590	46.7	15.76	15.55	20.34	2.71	21 44 42.78
26	116	35 40 40.7	145.92	+0.18	0.002 8705	+46.2	15.90	+15.54	20.33	2.68	21 40 46.87
27	117	36 39 1.8	145.83	+0.05	0.002 9809	45.8	16.04	15.53	20.33	2.65	21 36 50.96
28	118	37 37 20.7	145.75	-0.07	0.003 0903	45.4	16.18	15.52	20.32	2.62	21 32 55.05
29	119	38 35 37.6	145.66	0.19	0.003 1986	44.9	16.32	15.52	20.32	2.60	21 28 59.14
30	120	39 33 52.5	145.58	0.30	0.003 3059	44.5	16.45	15.51	20.31	2.57	21 25 3.24
May 1	121	40 32 5.4	145.49	-0.38	0.003 4124	+44.2	16.59	+15.50	20.31	2.54	21 21 7.33
2	122	41 30 16.2	145.41	0.44	0.003 5180	43.8	16.73	15.50	20.30	2.51	21 17 11.42
3	123	42 28 25.2	145.33	0.48	0.003 6229	43.5	16.87	15.50	20.30	2.49	21 13 15.51
4	124	43 26 32.2	145.25	0.49	0.003 7270	43.3	17.00	15.50	20.29	2.46	21 9 19.60
5	125	44 24 37.4	145.18	0.47	0.003 8306	43.0	17.14	15.50	20.29	2.43	21 5 23.69
6	126	45 22 40.9	145.11	-0.43	0.003 9335	+42.7	17.28	+15.50	20.28	2.40	21 1 27.78
7	127	46 20 42.6	145.04	0.36	0.004 0358	42.5	17.42	15.51	20.28	2.38	20 57 31.87
8	128	47 18 42.8	144.98	0.25	0.004 1375	42.3	17.55	15.51	20.27	2.35	20 53 35.96
9	129	48 16 41.4	144.91	0.14	0.004 2386	42.0	17.69	15.52	20.27	2.32	20 49 40.05
10	130	49 14 38.6	144.86	-0.01	0.004 3390	41.7	17.83	15.53	20.26	2.29	20 45 44.14
11	131	50 12 34.5	144.80	+0.12	0.004 4385	+41.3	17.97	+15.54	20.26	2.26	20 41 48.23
12	132	51 10 29.0	144.75	0.26	0.004 5371	40.8	18.10	15.55	20.25	2.24	20 37 52.32
13	133	52 8 22.4	144.69	0.37	0.004 6345	40.3	18.24	15.56	20.25	2.21	20 33 56.41
14	134	53 6 14.5	144.65	0.48	0.004 7306	39.8	18.38	15.57	20.24	2.18	20 30 0.50
15	135	54 4 5.5	144.60	0.57	0.004 8253	39.1	18.52	15.59	20.24	2.16	20 26 4.59
16	136	55 1 55.3	144.55	+0.62	0.004 9183	+38.4	18.65	+15.60	20.23	2.13	20 22 8.68
17	137	55 59 43.9	144.50	+0.63	0.005 0096	+37.6	18.79	+15.62	20.23	2.10	20 18 12.77

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.			
		h	m	s	s	°	'	"	"	'	"	m	s	h	m	s	
May 17	Th	3	34	39.57	9.917	+19	15	42.6	+34.07	15	50.48	8.70	+3 47.54	-0.060	3	38	27.11
18	Fr	3	38	37.87	9.941	19	29	10.5	33.26	15	50.28	8.70	3 45.80	0.064	3	42	23.67
19	Sa	3	42	36.74	9.964	19	42	18.6	33.43	15	50.09	8.70	3 43.49	0.108	3	46	20.22
20	Su	3	46	36.16	9.987	19	55	6.5	31.57	15	49.90	8.69	3 40.62	0.131	3	50	16.78
21	Mo	3	50	36.13	10.010	20	7	34.1	30.73	15	49.72	8.69	3 37.20	0.154	3	54	13.34
22	Tu	3	54	36.65	10.033	+20	19	41.0	+30.86	15	49.55	8.69	+3 33.25	-0.176	3	58	9.90
23	We	3	58	37.69	10.054	20	31	27.1	28.98	15	49.37	8.69	3 28.77	0.197	4	2	6.45
24	Th	4	2	39.23	10.075	20	42	52.0	28.00	15	49.21	8.69	3 23.78	0.218	4	6	3.01
25	Fr	4	6	41.28	10.096	20	53	55.5	27.20	15	49.04	8.69	3 18.29	0.239	4	9	59.57
26	Sa	4	10	43.81	10.115	21	4	37.4	26.29	15	48.88	8.69	3 12.32	0.260	4	13	56.12
27	Su	4	14	46.81	10.135	+21	14	57.5	+26.33	15	48.73	8.68	+3 5.87	-0.278	4	17	52.68
28	Mo	4	18	50.28	10.154	21	24	55.6	24.46	15	48.58	8.68	2 58.96	0.297	4	21	49.24
29	Tu	4	22	54.19	10.172	21	34	31.4	23.53	15	48.43	8.68	2 51.60	0.316	4	25	45.79
30	We	4	26	58.54	10.190	21	43	44.8	22.59	15	48.29	8.68	2 43.81	0.333	4	29	42.35
31	Th	4	31	3.30	10.207	21	52	35.6	21.64	15	48.15	8.68	2 35.61	0.350	4	33	38.91
June 1	Fr	4	35	8.47	10.223	+22	1	3.6	+20.09	15	48.01	8.68	+2 27.00	-0.367	4	37	35.47
2	Sa	4	39	14.02	10.239	22	9	8.6	19.73	15	47.88	8.68	2 18.00	0.383	4	41	32.02
3	Su	4	43	19.96	10.255	22	16	50.5	18.76	15	47.75	8.67	2 8.63	0.398	4	45	28.58
4	Mo	4	47	26.25	10.269	22	24	9.1	17.79	15	47.62	8.67	1 58.89	0.413	4	49	25.14
5	Tu	4	51	32.89	10.284	22	31	4.2	16.81	15	47.50	8.67	1 48.80	0.427	4	53	21.70
6	We	4	55	39.87	10.298	+22	37	35.8	+15.82	15	47.38	8.67	+1 38.38	-0.441	4	57	18.25
7	Th	4	59	47.18	10.311	22	43	43.6	14.83	15	47.26	8.67	1 27.64	0.454	5	1	14.81
8	Fr	5	3	54.79	10.323	22	49	27.5	13.83	15	47.14	8.67	1 16.59	0.467	5	5	11.37
9	Sa	5	8	2.69	10.335	22	54	47.4	12.83	15	47.03	8.67	1 5.24	0.479	5	9	7.93
10	Su	5	12	10.86	10.346	22	59	43.2	11.83	15	46.92	8.67	0 53.62	0.490	5	13	4.49
11	Mo	5	16	19.29	10.357	+23	4	14.7	+10.81	15	46.81	8.67	+0 41.75	-0.500	5	17	1.04
12	Tu	5	20	27.97	10.366	23	8	21.9	9.79	15	46.70	8.67	0 29.64	0.509	5	20	57.60
13	We	5	24	36.85	10.374	23	12	4.7	8.77	15	46.61	8.66	0 17.81	0.518	5	24	54.16
14	Th	5	28	45.93	10.382	23	15	22.8	7.74	15	46.51	8.66	+0 4.79	0.525	5	28	50.72
15	Fr	5	32	55.17	10.388	23	18	16.4	6.73	15	46.42	8.66	-0 7.89	0.532	5	32	47.28
16	Sa	5	37	4.55	10.393	+23	20	45.3	+5.69	15	46.34	8.66	-0 20.72	-0.537	5	36	43.88
17	Su	5	41	14.05	10.398	23	22	49.5	4.66	15	46.26	8.66	0 33.66	0.541	5	40	40.39
18	Mo	5	45	23.64	10.401	23	24	28.9	3.63	15	46.19	8.66	0 46.69	0.544	5	44	36.95
19	Tu	5	49	33.28	10.403	23	25	43.4	2.59	15	46.12	8.66	0 59.78	0.546	5	48	33.51
20	We	5	53	42.96	10.404	23	26	38.2	1.56	15	46.06	8.66	1 12.89	0.547	5	52	30.07
21	Th	5	57	52.64	10.403	+23	26	58.1	+0.52	15	46.00	8.66	-1 26.01	-0.546	5	56	26.62
22	Fr	6	2	2.29	10.401	23	26	58.3	-0.51	15	45.95	8.66	1 39.11	0.545	6	0	23.18
23	Sa	6	6	11.90	10.399	23	26	33.6	1.55	15	45.91	8.66	1 52.16	0.543	6	4	19.74
24	Su	6	10	21.42	10.395	23	25	44.1	2.58	15	45.87	8.66	2 5.13	0.538	6	8	16.30
25	Mo	6	14	30.85	10.390	23	24	29.9	3.61	15	45.83	8.66	2 17.99	0.533	6	12	12.86
26	Tu	6	18	40.15	10.384	+23	22	51.9	-4.63	15	45.80	8.66	-2 30.73	-0.528	6	16	9.41
27	We	6	22	49.29	10.377	23	20	47.5	5.66	15	45.77	8.66	2 43.32	0.521	6	20	5.97
28	Th	6	26	58.26	10.370	23	18	19.4	6.68	15	45.75	8.66	2 55.73	0.513	6	24	2.53
29	Fr	6	31	7.03	10.361	23	15	26.8	7.70	15	45.73	8.66	3 7.94	0.505	6	27	59.09
30	Sa	6	35	15.58	10.351	23	12	9.8	8.72	15	45.72	8.66	3 19.93	0.495	6	31	55.64
July 1	Su	6	39	23.88	10.341	+23	8	28.4	-9.73	15	45.71	8.66	-3 31.68	-0.484	6	35	52.20
2	Mo	6	43	31.93	10.330	+23	4	22.9	-10.73	15	45.71	8.66	-3 43.17	-0.473	6	39	48.76

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Pres. in Long.	Nut. in Long.	Aber. ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 27'	h m s
May 17	137	55 59 43.9	144.50	+0.63	0.005 0086	+37.6	18.79	+15.62	20.23	2.10	20 18 12.77
18	138	56 57 31.4	144.45	0.62	0.005 0089	38.8	18.93	15.64	20.23	2.08	20 14 16.86
19	139	57 55 17.6	144.40	0.58	0.005 1862	39.0	19.07	15.66	20.22	2.05	20 10 20.95
20	140	58 53 2.6	144.35	0.51	0.005 2715	39.1	19.20	15.68	20.22	2.02	20 6 25.04
21	141	59 50 46.3	144.29	0.42	0.005 3545	39.1	19.34	15.70	20.21	2.00	20 2 29.12
22	142	60 48 28.6	144.24	+0.30	0.005 4354	+33.3	19.48	+15.73	20.21	1.97	19 58 33.21
23	143	61 46 9.6	144.18	0.17	0.005 5142	33.4	19.62	15.75	20.21	1.95	19 54 37.30
24	144	62 43 49.2	144.13	+0.05	0.005 5909	31.5	19.76	15.78	20.20	1.92	19 50 41.39
25	145	63 41 27.3	144.06	-0.08	0.005 6655	30.7	19.89	15.80	20.20	1.90	19 46 45.48
26	146	64 39 4.0	144.00	0.20	0.005 7382	29.9	20.03	15.83	20.20	1.87	19 42 49.57
27	147	65 36 39.4	143.94	-0.31	0.005 8090	+29.1	20.17	+15.86	20.19	1.85	19 38 53.66
28	148	66 34 13.3	143.89	0.40	0.005 8779	28.3	20.31	15.89	20.19	1.83	19 34 57.75
29	149	67 31 45.9	143.83	0.46	0.005 9451	27.6	20.44	15.92	20.19	1.81	19 31 1.84
30	150	68 29 17.1	143.77	0.51	0.006 0106	26.9	20.58	15.95	20.18	1.78	19 27 5.92
31	151	69 26 47.0	143.72	0.53	0.006 0745	26.3	20.72	15.99	20.18	1.76	19 23 10.01
June 1	152	70 24 15.6	143.67	-0.51	0.006 1369	+25.7	20.86	+16.02	20.18	1.74	19 19 14.10
2	153	71 21 43.0	143.63	0.47	0.006 1979	25.1	20.99	16.05	20.17	1.72	19 15 18.19
3	154	72 19 9.2	143.57	0.40	0.006 2576	24.6	21.13	16.09	20.17	1.70	19 11 22.28
4	155	73 16 34.3	143.53	0.30	0.006 3160	24.1	21.27	16.13	20.17	1.68	19 7 26.37
5	156	74 13 58.4	143.49	0.19	0.006 3732	23.6	21.41	16.16	20.17	1.66	19 3 30.45
6	157	75 11 21.6	143.45	-0.06	0.006 4292	+23.1	21.54	+16.20	20.16	1.64	18 59 34.54
7	158	76 8 44.0	143.42	+0.07	0.006 4841	22.6	21.68	16.24	20.16	1.62	18 55 38.63
8	159	77 6 5.8	143.39	0.21	0.006 5376	22.0	21.82	16.28	20.16	1.60	18 51 42.72
9	160	78 3 26.9	143.37	0.34	0.006 5898	21.4	21.96	16.32	20.16	1.59	18 47 46.81
10	161	79 0 47.5	143.35	0.46	0.006 6404	20.8	22.09	16.36	20.15	1.57	18 43 50.89
11	162	79 58 7.6	143.33	+0.55	0.006 6894	+20.1	22.23	+16.40	20.15	1.55	18 39 54.98
12	163	80 55 27.4	143.31	0.61	0.006 7367	19.3	22.37	16.44	20.15	1.54	18 35 59.07
13	164	81 52 46.7	143.30	0.64	0.006 7819	18.4	22.51	16.48	20.15	1.52	18 32 3.16
14	165	82 50 5.7	143.28	0.63	0.006 8251	17.5	22.65	16.52	20.15	1.51	18 28 7.25
15	166	83 47 24.3	143.27	0.59	0.006 8660	16.6	22.78	16.56	20.14	1.50	18 24 11.33
16	167	84 44 42.6	143.25	+0.52	0.006 9046	+15.6	22.92	+16.60	20.14	1.48	18 20 15.42
17	168	85 42 0.4	143.24	0.43	0.006 9407	14.5	23.06	16.65	20.14	1.47	18 16 19.51
18	169	86 39 17.9	143.23	0.32	0.006 9743	13.5	23.20	16.69	20.14	1.46	18 12 23.60
19	170	87 36 34.9	143.20	0.20	0.007 0064	12.4	23.33	16.73	20.14	1.44	18 8 27.69
20	171	88 33 51.4	143.18	+0.07	0.007 0338	11.3	23.47	16.77	20.14	1.43	18 4 31.77
21	172	89 31 7.5	143.16	-0.06	0.007 0598	+10.3	23.61	+16.82	20.13	1.42	18 0 35.86
22	173	90 28 23.0	143.14	0.18	0.007 0832	9.2	23.75	16.86	20.13	1.41	17 56 39.95
23	174	91 25 38.0	143.11	0.31	0.007 1042	8.2	23.88	16.90	20.13	1.40	17 52 44.04
24	175	92 22 52.5	143.09	0.41	0.007 1228	7.3	24.02	16.94	20.13	1.40	17 48 48.13
25	176	93 20 6.5	143.07	0.48	0.007 1391	6.3	24.16	16.99	20.13	1.39	17 44 52.21
26	177	94 17 20.0	143.05	-0.53	0.007 1531	+ 5.4	24.30	+17.03	20.13	1.38	17 40 56.30
27	178	95 14 32.9	143.03	0.56	0.007 1650	4.5	24.43	17.07	20.13	1.37	17 37 0.39
28	179	96 11 45.4	143.01	0.56	0.007 1748	3.7	24.57	17.11	20.13	1.37	17 33 4.48
29	180	97 8 57.4	142.99	0.53	0.007 1827	2.9	24.71	17.15	20.13	1.36	17 29 8.57
30	181	98 6 9.1	142.98	0.48	0.007 1887	2.1	24.85	17.20	20.13	1.36	17 25 12.65
July 1	182	99 3 20.3	142.96	-0.39	0.007 1930	+ 1.4	24.98	+17.24	20.13	1.35	17 21 16.74
2	183	100 0 31.3	142.95	-0.28	0.007 1956	+ 0.8	25.12	+17.28	20.13	1.35	17 17 20.83

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
July 1	Su	6 39 23.88	10.841	+23 8 28.4	-9.73	15 45.71	8.66	-3 31.68	-0.484	6 35 52.20
2	Mo	6 43 31.98	10.830	23 4 22.9	10.73	15 45.71	8.66	3 43.17	0.473	6 39 48.76
3	Tu	6 47 39.69	10.817	22 59 53.2	11.74	15 45.70	8.66	3 54.37	0.461	6 43 45.32
4	We	6 51 47.16	10.805	22 54 59.4	12.74	15 45.70	8.66	4 5.28	0.448	6 47 41.88
5	Th	6 55 54.32	10.792	22 49 41.7	13.73	15 45.71	8.66	4 15.88	0.435	6 51 38.43
6	Fr	7 0 1.15	10.778	+22 44 0.2	-14.72	15 45.71	8.66	-4 26.16	-0.421	6 55 34.99
7	Sa	7 4 7.64	10.763	22 37 55.1	15.71	15 45.72	8.66	4 36.09	0.407	6 59 31.55
8	Su	7 8 13.78	10.748	22 31 26.3	16.69	15 45.74	8.66	4 45.67	0.392	7 3 28.11
9	Mo	7 12 19.55	10.733	22 24 34.2	17.66	15 45.75	8.66	4 54.89	0.376	7 7 24.66
10	Tu	7 16 24.94	10.716	22 17 18.8	18.63	15 45.77	8.66	5 3.72	0.360	7 11 21.22
11	We	7 20 29.92	10.699	+22 9 40.2	-19.59	15 45.80	8.66	-5 12.15	-0.343	7 15 17.78
12	Th	7 24 34.49	10.682	22 1 38.7	20.54	15 45.83	8.66	5 20.16	0.326	7 19 14.34
13	Fr	7 28 38.63	10.663	21 53 14.5	21.48	15 45.86	8.66	5 27.74	0.306	7 23 10.89
14	Sa	7 32 42.32	10.644	21 44 27.7	22.42	15 45.90	8.66	5 34.87	0.287	7 27 7.45
15	Su	7 36 45.54	10.624	21 35 18.6	23.34	15 45.94	8.66	5 41.53	0.268	7 31 4.01
16	Mo	7 40 48.28	10.604	+21 25 47.3	-24.26	15 45.99	8.66	-5 47.71	-0.247	7 35 0.57
17	Tu	7 44 50.52	10.583	21 15 54.1	25.17	15 46.04	8.66	5 53.39	0.226	7 38 57.12
18	We	7 48 52.24	10.561	21 5 39.2	26.07	15 46.11	8.66	5 58.56	0.204	7 42 53.68
19	Th	7 52 53.43	10.538	20 55 2.9	26.96	15 46.17	8.66	6 3.19	0.182	7 46 50.24
20	Fr	7 56 54.07	10.515	20 44 5.4	27.83	15 46.24	8.66	6 7.28	0.159	7 50 46.79
21	Sa	8 0 54.16	9.992	+20 32 47.0	-28.70	15 46.32	8.66	-6 10.81	-0.136	7 54 43.35
22	Su	8 4 53.68	9.968	20 21 7.8	29.56	15 46.40	8.66	6 13.78	0.112	7 58 39.91
23	Mo	8 8 52.62	9.944	20 9 8.3	30.40	15 46.49	8.66	6 16.16	0.087	8 2 36.46
24	Tu	8 12 50.97	9.919	19 56 48.5	31.24	15 46.58	8.66	6 17.95	0.062	8 6 33.02
25	We	8 16 48.73	9.894	19 44 8.9	32.06	15 46.68	8.66	6 19.15	0.037	8 10 29.58
26	Th	8 20 45.88	9.868	+19 31 9.7	-32.87	15 46.78	8.66	-6 19.74	-0.012	8 14 26.13
27	Fr	8 24 42.41	9.843	19 17 51.2	33.67	15 46.88	8.67	6 19.72	+0.014	8 18 22.69
28	Sa	8 28 38.33	9.817	19 4 13.5	34.46	15 46.99	8.67	6 19.08	0.039	8 22 19.25
29	Su	8 32 33.63	9.791	18 50 17.1	35.24	15 47.11	8.67	6 17.83	0.065	8 26 15.80
30	Mo	8 36 28.31	9.765	18 36 2.2	36.00	15 47.22	8.67	6 15.95	0.091	8 30 12.36
31	Tu	8 40 22.37	9.740	+18 21 29.0	-36.76	15 47.34	8.67	-6 13.45	+0.117	8 34 8.92
Aug. 1	We	8 44 15.81	9.714	18 6 37.8	37.50	15 47.47	8.67	6 10.34	0.143	8 38 5.47
2	Th	8 48 8.64	9.689	17 51 28.9	38.24	15 47.59	8.67	6 6.61	0.168	8 42 2.03
3	Fr	8 52 0.86	9.663	17 36 2.5	38.96	15 47.72	8.67	6 2.27	0.193	8 45 58.58
4	Sa	8 55 52.47	9.638	17 20 19.0	39.67	15 47.85	8.68	5 57.33	0.218	8 49 55.14
5	Su	8 59 43.49	9.614	+17 4 18.5	-40.37	15 47.99	8.68	-5 51.80	+0.243	8 53 51.70
6	Mo	9 3 33.93	9.589	16 48 1.4	41.06	15 48.12	8.68	5 45.68	0.267	8 57 48.25
7	Tu	9 7 23.78	9.565	16 31 27.9	41.73	15 48.26	8.68	5 38.98	0.291	9 1 44.81
8	We	9 11 13.06	9.542	16 14 38.3	42.40	15 48.41	8.68	5 31.70	0.315	9 5 41.36
9	Th	9 15 1.78	9.518	15 57 32.9	43.05	15 48.55	8.68	5 23.86	0.338	9 9 37.92
10	Fr	9 18 49.93	9.495	+15 40 12.0	-43.69	15 48.70	8.68	-5 15.46	+0.362	9 13 34.47
11	Sa	9 22 37.53	9.472	15 22 35.9	44.32	15 48.85	8.68	5 6.50	0.385	9 17 31.03
12	Su	9 26 24.58	9.449	15 4 44.9	44.93	15 49.01	8.68	4 56.99	0.408	9 21 27.58
13	Mo	9 30 11.08	9.425	14 46 39.4	45.53	15 49.17	8.69	4 46.94	0.430	9 25 24.14
14	Tu	9 33 57.04	9.404	14 28 19.7	46.11	15 49.34	8.69	4 36.35	0.453	9 29 20.69
15	We	9 37 42.47	9.382	+14 9 46.1	-46.68	15 49.51	8.69	-4 25.22	+0.475	9 33 17.25
16	Th	9 41 27.37	9.360	+13 50 58.9	-47.24	15 49.68	8.69	-4 13.57	+0.496	9 37 13.80

FOR GREENWICH MEAN NOON

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Pres. in Long.	Nut. in Long.	Aber. ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	" "	" "			" "	" "	" "	23° 27'	h m s
July	1	182 99 3 20.3	142.94	-0.39	0.007 1930	+ 1.4	24.98	+17.24	20.13	1.35	17 21 16.74
	2	183 100 0 31.3	142.95	0.28	0.007 1956	0.8	25.12	17.28	20.13	1.35	17 17 20.83
	3	184 100 57 42.0	142.95	0.15	0.007 1968	+ 0.2	25.26	17.32	20.13	1.35	17 13 24.92
	4	185 101 54 52.6	142.94	-0.02	0.007 1985	- 0.4	25.40	17.36	20.13	1.34	17 9 29.01
	5	186 102 52 3.2	142.94	+0.12	0.007 1949	1.0	25.53	17.40	20.13	1.34	17 5 33.09
	6	187 103 49 13.9	142.95	+0.26	0.007 1919	- 1.6	25.67	+17.43	20.13	1.34	17 1 37.18
	7	188 104 46 24.8	142.95	0.38	0.007 1874	2.2	25.81	17.47	20.13	1.34	16 57 41.27
	8	189 105 43 36.0	142.97	0.48	0.007 1814	2.8	25.95	17.51	20.13	1.34	16 53 45.36
	9	190 106 40 47.6	142.99	0.55	0.007 1739	3.5	26.09	17.54	20.13	1.34	16 49 49.45
	10	191 107 37 59.6	143.01	0.59	0.007 1646	4.3	26.22	17.58	20.13	1.34	16 45 53.54
	11	192 108 35 12.2	143.03	+0.60	0.007 1534	- 5.1	26.36	+17.62	20.13	1.34	16 41 57.63
	12	193 109 32 25.3	143.06	0.57	0.007 1402	5.9	26.50	17.65	20.13	1.34	16 38 1.71
	13	194 110 29 38.9	143.08	0.52	0.007 1248	6.9	26.64	17.68	20.13	1.34	16 34 5.80
	14	195 111 26 53.1	143.10	0.43	0.007 1071	7.9	26.77	17.71	20.13	1.34	16 30 9.89
	15	196 112 24 7.9	143.13	0.33	0.007 0871	8.9	26.91	17.75	20.13	1.34	16 26 13.96
	16	197 113 21 23.2	143.15	+0.20	0.007 0646	- 9.9	27.05	+17.78	20.13	1.35	16 22 18.07
	17	198 114 18 39.1	143.17	+0.06	0.007 0396	10.9	27.19	17.80	20.14	1.35	16 18 22.16
	18	199 115 15 55.4	143.19	-0.07	0.007 0121	12.0	27.32	17.83	20.14	1.36	16 14 26.25
	19	200 116 13 12.3	143.21	0.20	0.006 9820	13.0	27.46	17.86	20.14	1.36	16 10 30.34
	20	201 117 10 29.6	143.23	0.32	0.006 9495	14.1	27.60	17.89	20.14	1.37	16 6 34.42
	21	202 118 7 47.4	143.25	-0.42	0.006 9144	-15.1	27.74	+17.91	20.14	1.37	16 2 38.51
	22	203 119 5 5.6	143.27	0.50	0.006 8769	16.1	27.87	17.94	20.14	1.37	15 58 42.60
	23	204 120 2 24.2	143.29	0.56	0.006 8370	17.1	28.01	17.96	20.14	1.38	15 54 46.69
	24	205 120 59 43.3	143.30	0.61	0.006 7948	18.0	28.15	17.98	20.15	1.39	15 50 50.78
	25	206 121 57 2.8	143.32	0.62	0.006 7504	18.9	28.29	18.00	20.15	1.39	15 46 54.87
	26	207 122 54 22.7	143.34	-0.61	0.006 7039	-19.8	28.42	+18.02	20.15	1.40	15 42 58.96
	27	208 123 51 43.1	143.36	0.55	0.006 6554	20.6	28.56	18.04	20.15	1.41	15 39 3.05
	28	209 124 49 3.9	143.38	0.48	0.006 6049	21.4	28.70	18.05	20.16	1.41	15 35 7.14
	29	210 125 46 25.3	143.40	0.37	0.006 5527	22.1	28.84	18.07	20.16	1.42	15 31 11.23
	30	211 126 43 47.1	143.42	0.25	0.006 4989	22.7	28.98	18.08	20.16	1.43	15 27 15.32
	31	212 127 41 9.6	143.45	-0.13	0.006 4436	-23.3	29.11	+18.10	20.16	1.44	15 23 19.41
Aug.	1	213 128 38 32.7	143.48	+0.01	0.006 3870	23.8	29.25	18.11	20.17	1.44	15 19 23.50
	2	214 129 35 56.5	143.51	0.15	0.006 3292	24.3	29.39	18.12	20.17	1.45	15 15 27.59
	3	215 130 33 21.3	143.55	0.26	0.006 2702	24.8	29.53	18.12	20.17	1.46	15 11 31.68
	4	216 131 30 47.0	143.59	0.36	0.006 2101	25.3	29.66	18.13	20.17	1.47	15 7 35.77
	5	217 132 28 13.7	143.64	+0.44	0.006 1488	-25.8	29.80	+18.14	20.18	1.48	15 3 39.86
	6	218 133 25 41.7	143.69	0.49	0.006 0864	26.3	29.94	18.14	20.18	1.48	14 59 43.95
	7	219 134 23 10.9	143.75	0.51	0.006 0227	26.9	30.08	18.15	20.18	1.49	14 55 48.04
	8	220 135 20 41.5	143.80	0.49	0.005 9575	27.5	30.21	18.15	20.19	1.50	14 51 52.13
	9	221 136 18 13.4	143.85	0.44	0.005 8908	28.1	30.35	18.15	20.19	1.51	14 47 56.22
	10	222 137 15 46.8	143.92	+0.36	0.005 8224	-28.8	30.49	+18.15	20.19	1.52	14 44 0.31
	11	223 138 13 21.6	143.98	0.26	0.005 7523	29.6	30.63	18.15	20.20	1.53	14 40 4.40
	12	224 139 10 57.8	144.04	0.14	0.005 6802	30.4	30.76	18.14	20.20	1.53	14 36 8.49
	13	225 140 8 35.5	144.10	+0.01	0.005 6062	31.2	30.90	18.14	20.20	1.54	14 32 12.58
	14	226 141 6 14.6	144.16	-0.11	0.005 5302	32.1	31.04	18.13	20.21	1.55	14 28 16.67
	15	227 142 3 55.1	144.21	-0.23	0.005 4522	-33.0	31.18	+18.12	20.21	1.56	14 24 20.76
	16	228 143 1 37.0	144.27	-0.35	0.005 3720	-33.9	31.31	+18.11	20.21	1.57	14 20 24.85

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time, App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Aug. 16	Th	9 41 27.37	9.360	+13 50 58.9	-47.24	15 49.68	8.69	- 4 13.57	+0.498	9 37 13.80
17	Fr	9 45 11.76	9.339	13 31 58.5	47.79	15 49.86	8.69	4 1.40	0.618	9 41 10.36
18	Sa	9 48 55.63	9.317	13 12 45.2	48.33	15 50.05	8.70	3 48.72	0.639	9 45 6.91
19	Su	9 52 38.99	9.296	12 53 19.4	48.88	15 50.24	8.70	3 35.53	0.660	9 49 3.47
20	Mo	9 56 21.86	9.275	12 33 41.3	49.34	15 50.43	8.70	3 21.84	0.680	9 53 0.02
21	Tu	10 0 4.24	9.256	+12 13 51.3	-49.83	15 50.63	8.70	- 3 7.67	+0.699	9 56 56.58
22	We	10 3 46.15	9.236	11 53 49.8	50.30	15 50.83	8.70	2 53.02	0.699	10 0 53.13
23	Th	10 7 27.59	9.217	11 33 37.0	50.76	15 51.04	8.70	2 37.90	0.639	10 4 49.63
24	Fr	10 11 8.57	9.198	11 13 13.4	51.20	15 51.24	8.70	2 22.33	0.658	10 8 46.24
25	Sa	10 14 49.11	9.180	10 52 39.3	51.64	15 51.46	8.71	2 6.32	0.676	10 12 42.79
26	Su	10 18 29.22	9.162	+10 31 54.8	-52.06	15 51.67	8.71	- 1 49.87	+0.694	10 16 39.35
27	Mo	10 22 8.91	9.145	10 11 0.5	52.47	15 51.89	8.71	1 33.01	0.711	10 20 35.90
28	Tu	10 25 48.20	9.129	9 49 56.5	52.86	15 52.11	8.71	1 15.75	0.727	10 24 32.45
29	We	10 29 27.11	9.114	9 28 43.3	53.24	15 52.34	8.72	0 58.11	0.743	10 28 29.01
30	Th	10 33 5.66	9.099	9 7 21.1	53.61	15 52.56	8.72	0 40.10	0.758	10 32 25.56
31	Fr	10 36 43.86	9.085	+ 8 45 50.2	-53.97	15 52.79	8.72	- 0 21.74	+0.772	10 36 22.12
Sept. 1	Sa	10 40 21.73	9.072	8 24 10.8	54.31	15 53.01	8.72	- 0 3.06	0.785	10 40 18.67
2	Su	10 43 59.30	9.059	8 2 23.3	54.64	15 53.24	8.73	+ 0 15.92	0.797	10 44 15.22
3	Mo	10 47 36.59	9.048	7 40 28.0	54.96	15 53.47	8.73	0 35.19	0.808	10 48 11.78
4	Tu	10 51 13.62	9.038	7 18 25.2	55.27	15 53.70	8.73	0 54.71	0.818	10 52 8.33
5	We	10 54 50.41	9.028	+ 6 56 15.1	-55.57	15 53.94	8.73	+ 1 14.47	+0.828	10 56 4.88
6	Th	10 58 26.98	9.020	6 33 58.1	55.85	15 54.17	8.73	1 34.45	0.837	11 0 1.44
7	Fr	11 2 3.36	9.012	6 11 34.4	56.12	15 54.41	8.74	1 54.63	0.845	11 3 57.99
8	Sa	11 5 39.56	9.006	5 49 4.5	56.37	15 54.64	8.74	2 14.98	0.852	11 7 54.54
9	Su	11 9 15.60	8.998	5 26 28.7	56.61	15 54.88	8.74	2 35.50	0.858	11 11 51.09
10	Mo	11 12 51.49	8.993	+ 5 3 47.2	-56.84	15 55.13	8.74	+ 2 56.16	+0.863	11 15 47.65
11	Tu	11 16 27.26	8.988	4 41 0.4	57.06	15 55.37	8.74	3 16.94	0.868	11 19 44.20
12	We	11 20 2.92	8.984	4 18 8.7	57.28	15 55.62	8.75	3 37.83	0.873	11 23 40.75
13	Th	11 23 38.49	8.981	3 55 12.5	57.43	15 55.87	8.75	3 58.82	0.876	11 27 37.31
14	Fr	11 27 13.99	8.978	3 32 12.0	57.60	15 56.12	8.75	4 19.87	0.879	11 31 33.86
15	Sa	11 30 49.43	8.978	+ 3 9 7.7	-57.76	15 56.38	8.75	+ 4 40.99	+0.881	11 35 30.41
16	Su	11 34 24.83	8.974	2 45 59.8	57.90	15 56.63	8.76	5 2.14	0.882	11 39 26.97
17	Mo	11 38 0.20	8.974	2 22 48.7	58.02	15 56.90	8.76	5 23.32	0.886	11 43 23.52
18	Tu	11 41 35.57	8.974	1 59 34.8	58.13	15 57.16	8.76	5 44.50	0.882	11 47 20.07
19	We	11 45 10.96	8.975	1 36 18.5	58.23	15 57.43	8.76	6 5.67	0.881	11 51 16.62
20	Th	11 48 46.37	8.976	+ 1 13 0.0	-58.31	15 57.70	8.77	+ 6 26.80	+0.880	11 55 13.18
21	Fr	11 52 21.83	8.979	0 49 39.8	58.37	15 57.97	8.77	6 47.90	0.878	11 59 9.73
22	Sa	11 55 57.35	8.982	0 26 18.3	58.42	15 58.24	8.77	7 8.93	0.878	12 3 6.23
23	Su	11 59 32.96	8.986	+ 0 2 55.6	58.46	15 58.52	8.77	7 29.88	0.871	12 7 2.84
24	Mo	12 3 8.67	8.990	- 0 20 27.8	58.48	15 58.80	8.78	7 50.72	0.866	12 10 59.39
25	Tu	12 6 44.50	8.996	- 0 43 51.5	-58.49	15 59.07	8.78	+ 8 11.45	+0.861	12 14 55.94
26	We	12 10 20.47	9.002	1 7 15.3	58.49	15 59.35	8.78	8 32.08	0.854	12 18 52.50
27	Th	12 13 56.60	9.009	1 30 38.7	58.47	15 59.63	8.78	8 52.45	0.847	12 22 49.05
28	Fr	12 17 32.91	9.017	1 54 1.6	58.44	15 59.91	8.79	9 12.69	0.839	12 26 45.60
29	Sa	12 21 9.44	9.027	2 17 23.5	58.39	16 0.18	8.79	9 32.71	0.830	12 30 42.15
30	Su	12 24 46.20	9.037	- 2 40 44.1	-58.33	16 0.46	8.79	+ 9 52.50	+0.820	12 34 38.71
Oct. 1	Mo	12 28 23.22	9.048	- 3 4 3.2	-58.26	16 0.74	8.79	+10 12.04	+0.808	12 38 35.23

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Pres. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	" "	" "			" "	" "	" "	23° 27' "	h m s
Aug. 16	228	143 1 37.0	144.27	-0.35	0.006 8720	-33.9	31.31	+18.11	20.21	1.57	14 20 24.85
17	229	143 59 20.2	144.33	0.46	0.005 2897	34.7	31.45	18.10	20.22	1.58	14 16 28.94
18	230	144 57 4.8	144.39	0.55	0.005 2054	35.6	31.59	18.09	20.22	1.58	14 12 33.03
19	231	145 54 50.7	144.44	0.62	0.005 1190	36.4	31.73	18.08	20.22	1.59	14 8 37.13
20	232	146 52 37.9	144.49	0.66	0.005 0307	37.2	31.86	18.06	20.23	1.60	14 4 41.22
21	233	147 50 26.4	144.55	-0.67	0.004 9404	-38.0	32.00	+18.05	20.23	1.61	14 0 45.31
22	234	148 48 16.1	144.60	0.66	0.004 8482	38.8	32.14	18.03	20.24	1.61	13 56 49.40
23	235	149 46 7.1	144.66	0.62	0.004 7543	39.5	32.28	18.01	20.24	1.62	13 52 53.49
24	236	150 43 59.3	144.70	0.56	0.004 6586	40.2	32.42	17.99	20.25	1.63	13 48 57.58
25	237	151 41 52.7	144.75	0.46	0.004 5615	40.8	32.55	17.97	20.25	1.63	13 45 1.68
26	238	152 39 47.4	144.80	-0.35	0.004 4629	-41.3	32.69	+17.95	20.26	1.64	13 41 5.77
27	239	153 37 43.3	144.86	0.22	0.004 3631	41.8	32.83	17.92	20.26	1.64	13 37 9.86
28	240	154 35 40.5	144.91	-0.10	0.004 2622	42.2	32.97	17.90	20.26	1.65	13 33 13.95
29	241	155 33 39.0	144.97	+0.04	0.004 1604	42.6	33.10	17.87	20.27	1.65	13 29 18.04
30	242	156 31 38.9	145.06	0.16	0.004 0579	42.9	33.24	17.85	20.27	1.66	13 25 22.14
31	243	157 29 40.3	145.09	+0.27	0.003 9547	-43.1	33.38	+17.82	20.28	1.66	13 21 26.23
Sept. 1	244	158 27 43.2	145.16	0.35	0.003 8509	43.3	33.52	17.79	20.28	1.66	13 17 30.32
2	245	159 25 47.8	145.28	0.40	0.003 7467	43.5	33.65	17.76	20.29	1.67	13 13 34.41
3	246	160 23 54.2	145.30	0.42	0.003 6421	43.7	33.79	17.73	20.29	1.67	13 9 38.51
4	247	161 22 2.5	145.38	0.42	0.003 5369	44.0	33.93	17.70	20.30	1.67	13 5 42.60
5	248	162 20 12.6	145.47	+0.37	0.003 4311	-44.2	34.07	+17.66	20.30	1.67	13 1 46.69
6	249	163 18 24.8	145.55	0.30	0.003 3247	44.5	34.20	17.63	20.31	1.67	12 57 50.78
7	250	164 16 39.0	145.68	0.20	0.003 2175	44.9	34.34	17.60	20.31	1.67	12 53 54.88
8	251	165 14 55.3	145.73	+0.09	0.003 1093	45.3	34.48	17.56	20.32	1.67	12 49 58.97
9	252	166 13 13.6	145.81	-0.03	0.003 0002	45.7	34.62	17.52	20.32	1.67	12 46 3.06
10	253	167 11 34.1	145.89	-0.16	0.002 8900	-46.1	34.75	+17.49	20.33	1.67	12 42 7.16
11	254	168 9 56.6	145.98	0.28	0.002 7787	46.6	34.89	17.45	20.33	1.67	12 38 11.25
12	255	169 8 21.1	146.07	0.41	0.002 6662	47.1	35.03	17.41	20.34	1.67	12 34 15.34
13	256	170 6 47.7	146.15	0.51	0.002 5524	47.7	35.17	17.37	20.34	1.67	12 30 19.44
14	257	171 5 16.3	146.28	0.60	0.002 4374	48.2	35.30	17.33	20.35	1.66	12 26 23.53
15	258	172 3 46.9	146.31	-0.66	0.002 3211	-48.7	35.44	+17.30	20.36	1.66	12 22 27.62
16	259	173 2 19.4	146.39	0.70	0.002 2035	49.3	35.58	17.26	20.36	1.65	12 18 31.71
17	260	174 0 53.8	146.47	0.73	0.002 0847	49.8	35.72	17.22	20.37	1.65	12 14 35.81
18	261	174 59 30.1	146.55	0.73	0.001 9647	50.3	35.86	17.17	20.37	1.64	12 10 39.90
19	262	175 58 8.3	146.63	0.70	0.001 8435	50.7	35.99	17.13	20.38	1.63	12 6 43.99
20	263	176 56 48.2	146.70	-0.63	0.001 7213	-51.1	36.13	+17.09	20.38	1.63	12 2 48.09
21	264	177 55 29.9	146.77	0.54	0.001 5982	51.5	36.27	17.05	20.39	1.62	11 58 52.18
22	265	178 54 18.3	146.84	0.44	0.001 4741	51.8	36.41	17.01	20.39	1.61	11 54 56.27
23	266	179 52 58.4	146.91	0.32	0.001 3494	52.1	36.54	16.97	20.40	1.60	11 51 0.37
24	267	180 51 45.3	146.99	0.18	0.001 2241	52.3	36.68	16.93	20.41	1.59	11 47 4.46
25	268	181 50 33.8	147.06	-0.05	0.001 0984	-52.4	36.82	+16.88	20.41	1.58	11 43 8.55
26	269	182 49 24.0	147.13	+0.07	0.000 9724	52.5	36.96	16.84	20.42	1.57	11 39 12.64
27	270	183 48 16.0	147.30	0.18	0.000 8465	52.5	37.09	16.80	20.42	1.56	11 35 16.74
28	271	184 47 9.7	147.28	0.26	0.000 7206	52.4	37.23	16.76	20.43	1.55	11 31 20.83
29	272	185 46 5.2	147.35	0.31	0.000 5951	52.2	37.37	16.72	20.44	1.54	11 27 24.92
30	273	186 45 2.7	147.44	+0.34	0.000 4700	-52.1	37.51	+16.68	20.44	1.52	11 23 29.02
Oct. 1	274	187 44 2.2	147.52	+0.33	0.000 3453	-51.9	37.64	+16.64	20.45	1.51	11 19 33.11

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Oct. 1	Mo	12 28 23.22	9.048	— 3 4 3.2	—58.26	16 0.74	8.79	+10 12.04	+0.808	12 38 35.26
2	Tu	12 32 0.53	9.061	3 27 20.4	58.17	16 1.01	8.80	10 31.28	0.796	12 42 31.81
3	We	12 35 38.14	9.074	3 50 35.3	58.07	16 1.29	8.80	10 50.22	0.782	12 46 28.36
4	Th	12 39 16.09	9.089	4 13 47.7	57.96	16 1.56	8.80	11 8.82	0.768	12 50 24.92
5	Fr	12 42 54.40	9.104	4 36 57.2	57.83	16 1.83	8.80	11 27.07	0.753	12 54 21.47
6	Sa	12 46 33.09	9.120	— 5 0 3.5	—57.69	16 2.10	8.81	+11 44.94	+0.736	12 58 18.02
7	Su	12 50 12.17	9.137	5 23 6.1	57.53	16 2.37	8.81	12 2.40	0.719	13 2 14.58
8	Mo	12 53 51.68	9.155	5 46 4.7	57.36	16 2.64	8.81	12 19.45	0.701	13 6 11.13
9	Tu	12 57 31.63	9.174	6 8 58.9	57.16	16 2.92	8.81	12 36.06	0.682	13 10 7.68
10	We	13 1 12.03	9.193	6 31 48.3	56.96	16 3.19	8.82	12 52.20	0.663	13 14 4.24
11	Th	13 4 52.91	9.214	— 6 54 32.7	—56.74	16 3.46	8.82	+13 7.87	+0.643	13 18 0.79
12	Fr	13 8 34.29	9.235	7 17 11.5	56.49	16 3.73	8.82	13 23.05	0.622	13 21 57.34
13	Sa	13 12 16.18	9.256	7 39 44.3	56.24	16 4.00	8.82	13 37.72	0.600	13 25 53.90
14	Su	13 15 58.59	9.278	8 2 10.9	55.97	16 4.28	8.83	13 51.86	0.578	13 29 50.45
15	Mo	13 19 41.54	9.301	8 24 30.7	55.68	16 4.55	8.83	14 5.46	0.555	13 33 47.00
16	Tu	13 23 25.06	9.325	— 8 46 43.5	—55.38	16 4.82	8.83	+14 18.50	+0.531	13 37 43.56
17	We	13 27 9.15	9.349	9 8 48.7	55.06	16 5.10	8.83	14 30.96	0.507	13 41 40.11
18	Th	13 30 53.82	9.374	9 30 46.0	54.72	16 5.37	8.84	14 42.85	0.483	13 45 36.66
19	Fr	13 34 39.09	9.399	9 52 34.9	54.36	16 5.65	8.84	14 54.13	0.457	13 49 33.22
20	Sa	13 38 24.97	9.425	10 14 15.1	53.99	16 5.92	8.84	15 4.80	0.432	13 53 29.77
21	Su	13 42 11.48	9.451	—10 35 46.3	—53.60	16 6.20	8.84	+15 14.84	+0.405	13 57 26.32
22	Mo	13 45 58.63	9.478	10 57 7.9	53.19	16 6.47	8.85	15 24.25	0.379	14 1 22.88
23	Tu	13 49 46.43	9.505	11 18 19.5	52.77	16 6.75	8.85	15 33.01	0.351	14 5 19.43
24	We	13 53 34.89	9.533	11 39 20.8	52.33	16 7.02	8.85	15 41.09	0.323	14 9 15.99
25	Th	13 57 24.04	9.562	12 0 11.5	51.88	16 7.29	8.85	15 48.50	0.295	14 13 12.54
26	Fr	14 1 13.88	9.591	—12 20 51.1	—51.41	16 7.56	8.86	+15 55.22	+0.265	14 17 9.10
27	Sa	14 5 4.43	9.621	12 41 19.2	50.93	16 7.82	8.86	16 1.22	0.235	14 21 5.65
28	Su	14 8 55.71	9.652	13 1 35.4	50.43	16 8.09	8.86	16 6.49	0.204	14 25 2.20
29	Mo	14 12 47.73	9.683	13 21 39.5	49.91	16 8.35	8.86	16 11.03	0.173	14 28 58.76
30	Tu	14 16 40.51	9.715	13 41 30.9	49.37	16 8.60	8.87	16 14.80	0.141	14 32 55.31
31	We	14 20 34.07	9.748	—14 1 9.3	—48.82	16 8.86	8.87	+16 17.80	+0.108	14 36 51.87
Nov. 1	Th	14 24 28.42	9.781	14 20 34.4	48.26	16 9.11	8.87	16 20.00	0.075	14 40 48.42
2	Fr	14 28 23.57	9.815	14 39 45.7	47.68	16 9.35	8.87	16 21.40	0.042	14 44 44.98
3	Sa	14 32 19.54	9.849	14 58 42.9	47.08	16 9.59	8.87	16 21.99	+0.007	14 48 41.53
4	Su	14 36 16.34	9.884	15 17 25.4	46.46	16 9.83	8.88	16 21.75	—0.028	14 52 38.09
5	Mo	14 40 13.98	9.919	—15 35 53.0	—45.83	16 10.07	8.88	+16 20.66	—0.063	14 56 34.64
6	Tu	14 44 12.47	9.955	15 54 5.2	45.18	16 10.30	8.88	16 18.73	0.098	15 0 31.20
7	We	14 48 11.80	9.990	16 12 1.6	44.51	16 10.54	8.88	16 15.95	0.133	15 4 27.75
8	Th	14 52 11.99	10.026	16 29 41.8	43.83	16 10.77	8.88	16 12.32	0.169	15 8 24.31
9	Fr	14 56 13.04	10.062	16 47 5.3	43.13	16 10.99	8.89	16 7.82	0.205	15 12 20.87
10	Sa	15 0 14.96	10.098	—17 4 11.7	—42.41	16 11.22	8.89	+16 2.46	—0.241	15 16 17.42
11	Su	15 4 17.73	10.134	17 21 0.7	41.67	16 11.44	8.89	15 56.25	0.277	15 20 13.98
12	Mo	15 8 21.37	10.169	17 37 31.8	40.92	16 11.66	8.89	15 49.17	0.313	15 24 10.53
13	Tu	15 12 25.86	10.205	17 53 44.7	40.15	16 11.88	8.90	15 41.23	0.349	15 28 7.09
14	We	15 16 31.21	10.241	18 9 38.8	39.36	16 12.10	8.90	15 32.43	0.384	15 32 3.65
15	Th	15 20 37.41	10.276	—18 25 13.8	—38.55	16 12.31	8.90	+15 22.79	—0.419	15 36 0.20
16	Fr	15 24 44.46	10.311	—18 40 29.3	—37.73	16 12.53	8.90	+15 12.30	—0.454	15 39 56.76

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	"	"			"	"	"	23° 27'	h m s
Oct.	1	274 187 44 2.2	147.52	+0.33	0.000 3458	-51.9	37.64	+16.64	20.45	1.51	11 19 33.11
	2	275 188 43 3.7	147.61	0.30	0.000 2211	51.7	37.78	16.60	20.45	1.49	11 15 37.20
	3	276 189 42 7.4	147.70	0.23	0.000 0974	51.5	37.92	16.56	20.46	1.48	11 11 41.30
	4	277 190 41 13.4	147.80	0.13	9.999 9741	51.3	38.06	16.52	20.47	1.46	11 7 45.39
	5	278 191 40 21.6	147.89	+0.02	9.999 8512	51.2	38.19	16.48	20.47	1.45	11 3 49.48
	6	279 192 39 32.1	147.99	-0.10	9.999 7285	-51.1	38.33	+16.44	20.48	1.43	10 59 53.57
	7	280 193 38 45.0	148.09	0.23	9.999 6060	51.0	38.47	16.40	20.48	1.41	10 55 57.67
	8	281 194 38 0.2	148.18	0.35	9.999 4836	51.0	38.61	16.37	20.49	1.39	10 52 1.76
	9	282 195 37 17.7	148.28	0.47	9.999 3612	51.0	38.75	16.33	20.49	1.37	10 48 5.85
	10	283 196 36 37.5	148.37	0.58	9.999 2388	51.0	38.88	16.30	20.50	1.35	10 44 9.95
	11	284 197 35 59.6	148.47	-0.67	9.999 1163	-51.1	39.02	+16.26	20.51	1.33	10 40 14.04
	12	285 198 35 24.0	148.56	0.74	9.998 9936	51.2	39.16	16.23	20.51	1.31	10 36 18.13
	13	286 199 34 50.6	148.65	0.79	9.998 8707	51.2	39.30	16.20	20.52	1.29	10 32 22.22
	14	287 200 34 19.3	148.74	0.80	9.998 7476	51.3	39.43	16.16	20.52	1.27	10 28 26.31
	15	288 201 33 50.1	148.83	0.79	9.998 6248	51.4	39.57	16.13	20.53	1.25	10 24 30.41
	16	289 202 33 23.1	148.91	-0.76	9.998 5008	-51.5	39.71	+16.10	20.54	1.22	10 20 34.50
	17	290 203 32 58.0	149.00	0.70	9.998 3772	51.5	39.85	16.07	20.54	1.20	10 16 38.59
	18	291 204 32 34.9	149.08	0.62	9.998 2534	51.6	39.98	16.05	20.55	1.18	10 12 42.68
	19	292 205 32 13.7	149.16	0.50	9.998 1295	51.6	40.12	16.02	20.55	1.15	10 8 46.78
	20	293 206 31 54.3	149.23	0.38	9.998 0057	51.6	40.26	16.00	20.56	1.13	10 4 50.87
	21	294 207 31 36.7	149.30	-0.25	9.997 8820	-51.5	40.40	+15.97	20.56	1.10	10 0 54.96
	22	295 208 31 20.8	149.37	-0.13	9.997 7587	51.3	40.53	15.95	20.57	1.08	9 56 59.05
	23	296 209 31 6.6	149.44	0.00	9.997 6357	51.1	40.67	15.93	20.58	1.05	9 53 3.14
	24	297 210 30 54.1	149.51	+0.11	9.997 5135	50.8	40.81	15.91	20.58	1.02	9 49 7.24
	25	298 211 30 43.2	149.58	0.20	9.997 3920	50.4	40.95	15.89	20.59	1.00	9 45 11.33
	26	299 212 30 34.0	149.65	+0.26	9.997 2716	-49.9	41.08	+15.87	20.59	0.97	9 41 15.42
	27	300 213 30 26.5	149.72	0.29	9.997 1523	49.5	41.22	15.85	20.60	0.94	9 37 19.51
	28	301 214 30 20.7	149.80	0.29	9.997 0343	49.9	41.36	15.84	20.60	0.91	9 33 23.60
	29	302 215 30 16.8	149.87	0.26	9.996 9178	49.2	41.50	15.83	20.61	0.89	9 29 27.69
	30	303 216 30 14.6	149.95	0.19	9.996 8028	47.6	41.63	15.82	20.62	0.86	9 25 31.79
	31	304 217 30 14.4	150.06	+0.09	9.996 6893	-46.9	41.77	+15.80	20.62	0.83	9 21 35.88
Nov.	1	305 218 30 16.2	150.11	-0.02	9.996 5775	46.3	41.91	15.80	20.63	0.80	9 17 39.97
	2	306 219 30 19.9	150.20	0.15	9.996 4671	45.7	42.05	15.79	20.63	0.77	9 13 44.06
	3	307 220 30 25.7	150.28	0.28	9.996 3582	45.1	42.19	15.78	20.64	0.74	9 9 48.15
	4	308 221 30 33.6	150.37	0.40	9.996 2508	44.5	42.32	15.78	20.64	0.72	9 5 52.24
	5	309 222 30 43.5	150.46	-0.53	9.996 1446	-44.0	42.46	+15.78	20.65	0.69	9 1 56.33
	6	310 223 30 55.6	150.55	0.64	9.996 0397	43.5	42.60	15.78	20.65	0.66	8 58 0.42
	7	311 224 31 9.7	150.63	0.73	9.995 9359	43.0	42.74	15.78	20.66	0.63	8 54 4.51
	8	312 225 31 25.8	150.71	0.80	9.995 8333	42.6	42.87	15.78	20.66	0.60	8 50 8.60
	9	313 226 31 43.9	150.79	0.84	9.995 7316	42.1	43.01	15.78	20.67	0.57	8 46 12.69
	10	314 227 32 3.9	150.87	-0.86	9.995 6310	-41.7	43.15	+15.79	20.67	0.54	8 42 16.78
	11	315 228 32 25.9	150.95	0.85	9.995 5313	41.3	43.29	15.80	20.68	0.51	8 38 20.87
	12	316 229 32 49.7	151.03	0.81	9.995 4325	41.0	43.42	15.80	20.68	0.48	8 34 24.96
	13	317 230 33 15.3	151.10	0.76	9.995 3345	40.7	43.56	15.81	20.69	0.45	8 30 29.05
	14	318 231 33 42.6	151.17	0.68	9.995 2373	40.3	43.70	15.83	20.69	0.42	8 26 33.14
	15	319 232 34 11.5	151.24	-0.56	9.995 1410	-40.0	43.84	+15.84	20.69	0.39	8 22 37.23
	16	320 233 34 42.0	151.30	-0.44	9.995 0455	-39.6	43.97	+15.86	20.70	0.37	8 18 41.32

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.		
		h	m	s	s	°	'	"	"	'	"	m	s	h	m	s
Nov. 16	Fr	15	24	44.46	10.311	-18	40	29.3	-37.73	16	12.53	8.90	+15 12.30	-0.454	15	39 56.76
17	Sa	15	28	52.34	10.345	18	55	24.9	36.90	16	12.74	8.90	15 0.98	0.489	15	43 53.31
18	Su	15	33	1.04	10.380	19	10	0.2	36.05	16	12.95	8.90	14 48.83	0.523	15	47 49.87
19	Mo	15	37	10.56	10.413	19	24	14.9	35.18	16	13.16	8.91	14 35.87	0.557	15	51 46.43
20	Tu	15	41	20.88	10.447	19	38	8.5	34.29	16	13.36	8.91	14 22.10	0.590	15	55 42.98
21	We	15	45	32.00	10.480	-19	51	40.6	-33.39	16	13.56	8.91	+14 7.54	-0.623	15	59 39.54
22	Th	15	49	43.90	10.512	20	4	51.0	32.48	16	13.76	8.91	13 52.19	0.655	16	3 36.10
23	Fr	15	53	56.58	10.544	20	17	39.3	31.54	16	13.96	8.91	13 36.08	0.687	16	7 32.65
24	Sa	15	58	10.02	10.576	20	30	5.0	30.60	16	14.14	8.92	13 19.20	0.719	16	11 29.21
25	Su	16	2	24.21	10.607	20	42	8.0	29.65	16	14.33	8.92	13 1.56	0.750	16	15 25.77
26	Mo	16	6	39.14	10.637	-20	53	47.9	-28.66	16	14.51	8.92	+12 43.19	-0.781	16	19 22.33
27	Tu	16	10	54.80	10.668	21	5	4.3	27.69	16	14.69	8.92	12 24.09	0.811	16	23 18.88
28	We	16	15	11.18	10.697	21	15	57.0	26.70	16	14.86	8.92	12 4.26	0.841	16	27 15.44
29	Th	16	19	28.26	10.726	21	26	25.6	25.69	16	15.02	8.92	11 43.73	0.870	16	31 12.00
30	Fr	16	23	46.04	10.755	21	36	29.8	24.65	16	15.18	8.93	11 22.51	0.898	16	35 8.55
Dec. 1	Sa	16	28	4.50	10.783	-21	46	9.4	-23.63	16	15.34	8.93	+11 0.61	-0.926	16	39 5.11
2	Su	16	32	23.62	10.810	21	55	24.0	22.58	16	15.49	8.93	10 38.05	0.953	16	43 1.67
3	Mo	16	36	43.38	10.836	22	4	13.3	21.52	16	15.63	8.93	10 14.85	0.980	16	46 58.23
4	Tu	16	41	3.76	10.862	22	12	37.1	20.46	16	15.77	8.93	9 51.02	1.005	16	50 54.79
5	We	16	45	24.75	10.887	22	20	35.1	19.38	16	15.90	8.93	9 26.60	1.030	16	54 51.34
6	Th	16	49	46.31	10.910	-22	28	7.1	-18.29	16	16.03	8.93	+ 9 1.59	-1.054	16	58 47.90
7	Fr	16	54	8.42	10.932	22	35	12.8	17.19	16	16.15	8.93	8 36.04	1.076	17	2 44.46
8	Sa	16	58	31.05	10.954	22	41	52.0	16.06	16	16.27	8.94	8 9.96	1.097	17	6 41.02
9	Su	17	2	54.18	10.974	22	48	4.4	14.96	16	16.39	8.94	7 43.39	1.117	17	10 37.58
10	Mo	17	7	17.78	10.993	22	53	49.9	13.83	16	16.50	8.94	7 16.35	1.136	17	14 34.13
11	Tu	17	11	41.82	11.010	-22	59	8.3	-12.70	16	16.61	8.94	+ 6 48.87	-1.153	17	18 30.69
12	We	17	16	6.25	11.026	23	3	59.3	11.56	16	16.71	8.94	6 21.00	1.169	17	22 27.25
13	Th	17	20	31.05	11.041	23	8	22.9	10.41	16	16.82	8.94	5 52.75	1.184	17	26 23.81
14	Fr	17	24	56.19	11.054	23	12	18.8	9.25	16	16.91	8.94	5 24.18	1.197	17	30 20.37
15	Sa	17	29	21.62	11.065	23	15	47.0	8.09	16	17.01	8.94	4 55.90	1.209	17	34 16.92
16	Su	17	33	47.31	11.075	-23	18	47.3	-6.93	16	17.10	8.94	+ 4 26.17	-1.219	17	38 13.48
17	Mo	17	38	13.22	11.084	23	21	19.6	5.76	16	17.18	8.94	3 56.82	1.227	17	42 10.04
18	Tu	17	42	39.32	11.091	23	23	23.8	4.69	16	17.27	8.94	3 27.28	1.234	17	46 6.60
19	We	17	47	5.56	11.096	23	24	59.9	3.42	16	17.35	8.95	2 57.60	1.239	17	50 3.16
20	Th	17	51	31.91	11.100	23	26	7.9	2.24	16	17.42	8.95	2 27.81	1.243	17	53 59.72
21	Fr	17	55	58.33	11.102	-23	26	47.6	-1.07	16	17.49	8.95	+ 1 57.94	-1.245	17	57 56.27
22	Sa	18	0	24.79	11.103	23	26	59.1	+ 0.11	16	17.56	8.95	1 28.04	1.246	18	1 52.83
23	Su	18	4	51.26	11.103	23	26	42.4	1.29	16	17.61	8.95	0 58.13	1.246	18	5 49.39
24	Mo	18	9	17.70	11.101	23	25	57.4	2.46	16	17.67	8.95	+ 0 28.24	1.244	18	9 45.95
25	Tu	18	13	44.09	11.098	23	24	44.2	3.64	16	17.72	8.95	- 0 1.58	1.241	18	13 42.51
26	We	18	18	10.38	11.093	-23	23	2.8	+ 4.81	16	17.76	8.95	- 0 31.32	-1.237	18	17 39.07
27	Th	18	22	36.56	11.088	23	20	53.3	5.98	16	17.80	8.95	1 0.94	1.231	18	21 35.62
28	Fr	18	27	2.59	11.081	23	18	15.6	7.15	16	17.83	8.95	1 30.41	1.225	18	25 32.18
29	Sa	18	31	28.45	11.073	23	15	9.9	8.32	16	17.85	8.95	1 59.71	1.217	18	29 28.74
30	Su	18	35	54.10	11.064	23	11	36.2	9.48	16	17.87	8.95	2 28.80	1.208	18	33 25.30
31	Mo	18	40	19.51	11.053	-23	7	34.7	+10.64	16	17.88	8.95	- 2 57.66	-1.197	18	37 21.86
32	Tu	18	44	44.66	11.042	-23	3	5.4	+11.80	16	17.88	8.95	- 3 26.25	-1.185	18	41 18.41

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prece. in Long.	Nut. in Long.	Aber. ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" " "	"	"			"	"	"	23° 26'	h m s
Nov. 16	320	233 34 42.0	151.30	-0.44	9.995 0455	-39.6	43.97	+15.86	20.70	60.37	8 18 41.32
17	321	234 35 14.0	151.36	0.31	9.994 9510	39.2	44.11	15.87	20.70	60.34	8 14 45.41
18	322	235 35 47.4	151.42	0.17	9.994 8574	38.8	44.25	15.89	20.71	60.31	8 10 49.50
19	323	236 36 22.0	151.47	-0.04	9.994 7649	38.3	44.39	15.91	20.71	60.28	8 6 53.59
20	324	237 36 57.9	151.52	+0.08	9.994 6736	37.8	44.52	15.93	20.72	60.25	8 2 57.68
21	325	238 37 35.0	151.57	+0.17	9.994 5837	-37.1	44.66	+15.95	20.72	60.23	7 59 1.77
22	326	239 38 13.2	151.61	0.24	9.994 4955	36.4	44.80	15.98	20.73	60.20	7 55 5.86
23	327	240 38 52.5	151.66	0.28	9.994 4089	35.7	44.94	16.00	20.73	60.17	7 51 9.95
24	328	241 39 32.9	151.71	0.29	9.994 3243	34.8	45.08	16.03	20.73	60.14	7 47 14.04
25	329	242 40 14.4	151.75	0.27	9.994 2417	34.0	45.21	16.06	20.74	60.12	7 43 18.13
26	330	243 40 57.0	151.80	+0.21	9.994 1613	-33.0	45.35	+16.09	20.74	60.09	7 39 22.21
27	331	244 41 40.7	151.85	0.12	9.994 0832	32.0	45.49	16.12	20.75	60.07	7 35 26.30
28	332	245 42 25.7	151.90	+0.02	9.994 0076	31.0	45.63	16.15	20.75	60.04	7 31 30.39
29	333	246 43 11.8	151.95	-0.10	9.993 9344	30.0	45.76	16.19	20.75	60.02	7 27 34.48
30	334	247 43 59.2	152.00	0.23	9.993 8636	29.0	45.90	16.22	20.76	59.99	7 23 38.57
Dec. 1	335	248 44 47.9	152.06	-0.36	9.993 7953	-28.0	46.04	+16.25	20.76	59.97	7 19 42.66
2	336	249 45 38.0	152.11	0.49	9.993 7294	27.0	46.18	16.29	20.76	59.95	7 15 46.74
3	337	250 46 29.3	152.17	0.60	9.993 6658	26.0	46.31	16.33	20.76	59.92	7 11 50.83
4	338	251 47 22.0	152.22	0.71	9.993 6044	25.1	46.45	16.37	20.77	59.90	7 7 54.92
5	339	252 48 16.0	152.28	0.78	9.993 5451	24.2	46.59	16.41	20.77	59.88	7 3 59.01
6	340	253 49 11.2	152.33	-0.84	9.993 4880	-23.4	46.73	+16.45	20.77	59.86	7 0 3.10
7	341	254 50 7.8	152.38	0.85	9.993 4328	22.6	46.86	16.49	20.78	59.84	6 56 7.18
8	342	255 51 5.5	152.43	0.85	9.993 3796	21.8	47.00	16.53	20.78	59.82	6 52 11.27
9	343	256 52 4.4	152.48	0.82	9.993 3282	21.1	47.14	16.58	20.78	59.80	6 48 15.36
10	344	257 53 4.4	152.52	0.76	9.993 2785	20.3	47.28	16.62	20.78	59.78	6 44 19.45
11	345	258 54 5.5	152.57	-0.68	9.993 2306	-19.6	47.41	+16.67	20.79	59.77	6 40 23.54
12	346	259 55 7.6	152.60	0.58	9.993 1842	19.0	47.55	16.71	20.79	59.75	6 36 27.62
13	347	260 56 10.6	152.64	0.46	9.993 1394	18.4	47.69	16.76	20.79	59.73	6 32 31.71
14	348	261 57 14.4	152.67	0.31	9.993 0960	17.8	47.83	16.81	20.79	59.72	6 28 35.80
15	349	262 58 18.9	152.70	0.17	9.993 0542	17.1	47.96	16.85	20.79	59.70	6 24 39.89
16	350	263 59 24.0	152.72	-0.04	9.993 0139	-16.5	48.10	+16.90	20.80	59.69	6 20 43.98
17	351	265 0 29.6	152.74	+0.09	9.992 9751	15.8	48.24	16.95	20.80	59.67	6 16 48.06
18	352	266 1 35.6	152.76	0.21	9.992 9380	15.1	48.38	17.00	20.80	59.66	6 12 52.15
19	353	267 2 41.9	152.77	0.29	9.992 9027	14.3	48.52	17.04	20.80	59.65	6 8 56.24
20	354	268 3 48.4	152.78	0.35	9.992 8693	13.5	48.65	17.09	20.80	59.63	6 5 0.33
21	355	269 4 55.1	152.78	+0.37	9.992 8381	-12.6	48.79	+17.14	20.80	59.62	6 1 4.41
22	356	270 6 2.0	152.79	0.35	9.992 8090	11.6	48.93	17.19	20.81	59.61	5 57 8.50
23	357	271 7 9.0	152.79	0.31	9.992 7824	10.6	49.07	17.24	20.81	59.60	5 53 12.59
24	358	272 8 16.1	152.80	0.23	9.992 7583	9.5	49.20	17.29	20.81	59.59	5 49 16.67
25	359	273 9 23.4	152.81	0.14	9.992 7368	8.4	49.34	17.34	20.81	59.59	5 45 20.76
26	360	274 10 30.7	152.81	+0.02	9.992 7181	-7.2	49.48	+17.39	20.81	59.58	5 41 24.85
27	361	275 11 38.2	152.82	-0.12	9.992 7022	6.0	49.62	17.43	20.81	59.57	5 37 28.94
28	362	276 12 45.9	152.82	0.24	9.992 6891	4.8	49.75	17.48	20.81	59.57	5 33 33.03
29	363	277 13 53.8	152.83	0.37	9.992 6790	3.6	49.89	17.53	20.81	59.56	5 29 37.11
30	364	278 15 1.9	152.84	0.50	9.992 6716	2.5	50.03	17.58	20.81	59.56	5 25 41.20
31	365	279 16 10.2	152.85	-0.61	9.992 6670	-1.4	50.17	+17.62	20.81	59.55	5 21 45.29
32	366	280 17 18.8	152.86	-0.69	9.992 6651	-0.2	50.30	+17.67	20.81	59.55	5 17 49.38

GREENWICH MEAN TIME.

Date.	X		Reduc. to Mean Eq'x of 1917.0.	Y		Reduc. to Mean Eq'x of 1917.0.	Z		Reduc. to Mean Eq'x of 1917.0.
	True Equinox.			True Equinox.			True Equinox.		
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Jan. 1	+0.179 8639	+0.188 4540	-776	-0.886 8288	-0.885 3217	-184	-0.384 6965	-0.384 0428	+ 60
2	0.197 0291	0.205 5885	782	0.883 7459	0.882 1013	198	0.383 3592	0.382 6459	54
3	0.214 1317	0.222 6579	788	0.880 3884	0.878 6071	212	0.381 9030	0.381 1305	47
4	0.231 1666	0.239 6571	793	0.876 7579	0.874 8408	226	0.380 3284	0.379 4971	40
5	0.248 1287	0.256 5809	798	0.872 8560	0.870 8035	241	0.378 6364	0.377 7463	33
6	+0.265 0131	+0.273 4247	-803	-0.868 6836	-0.866 4962	-256	-0.376 8270	-0.375 8785	+ 26
7	0.281 8150	0.290 1834	807	0.864 2419	0.861 9207	271	0.374 9009	0.373 8943	19
8	0.298 5293	0.306 8522	811	0.859 5328	0.857 0782	286	0.372 8588	0.371 7943	12
9	0.315 1513	0.323 4261	814	0.854 5572	0.851 9699	302	0.370 7010	0.369 5790	+ 4
10	0.331 6759	0.339 9002	817	0.849 3167	0.846 5978	318	0.368 4284	0.367 2493	- 3
11	+0.348 0983	+0.356 2696	-820	-0.843 8133	-0.840 9634	-334	-0.366 0417	-0.364 8057	- 11
12	0.364 4135	0.372 5295	822	0.838 0482	0.835 0679	350	0.363 5413	0.362 2487	18
13	0.380 6169	0.388 6751	824	0.832 0228	0.828 9130	366	0.360 9279	0.359 5790	26
14	0.396 7034	0.404 7011	826	0.825 7388	0.822 5005	382	0.358 2022	0.356 7975	34
15	0.412 6678	0.420 6029	827	0.819 1982	0.815 8322	399	0.355 3651	0.353 9050	42
16	+0.428 5056	+0.436 3754	-827	-0.812 4027	-0.808 9098	-415	-0.352 4172	-0.350 9019	- 50
17	0.444 2116	0.452 0137	827	0.805 3539	0.801 7353	432	0.349 3593	0.347 7894	58
18	0.459 7809	0.467 5127	827	0.798 0542	0.794 3107	448	0.346 1924	0.344 5683	66
19	0.475 2084	0.482 8674	827	0.790 5052	0.786 6379	465	0.342 9172	0.341 2394	74
20	0.490 4890	0.498 0726	826	0.782 7092	0.778 7194	482	0.339 5349	0.337 8038	82
21	+0.505 6175	+0.513 1232	-824	-0.774 6688	-0.770 5576	-499	-0.336 0463	-0.334 2626	- 90
22	0.520 5889	0.528 0140	822	0.766 3862	0.762 1548	516	0.332 4527	0.330 6168	98
23	0.535 3980	0.542 7402	820	0.757 8639	0.753 5140	533	0.328 7551	0.326 8678	107
24	0.550 0400	0.557 2968	817	0.749 1053	0.744 6382	550	0.324 9552	0.323 0172	116
25	0.564 5100	0.571 6790	813	0.740 1132	0.735 5308	567	0.321 0539	0.319 0657	124
26	+0.578 8032	+0.585 8821	-809	-0.730 8912	-0.726 1949	-584	-0.317 0528	-0.315 0154	-132
27	0.592 9153	0.599 9021	805	0.721 4423	0.716 6338	601	0.312 9537	0.310 8678	141
28	0.606 8421	0.613 7347	800	0.711 7699	0.706 8510	618	0.308 7578	0.306 6240	150
29	0.620 5793	0.627 3755	795	0.701 8775	0.696 8500	635	0.304 4665	0.302 2856	158
30	0.634 1229	0.640 8210	789	0.691 7687	0.686 6340	652	0.300 0815	0.297 8543	166
31	+0.647 4693	+0.654 0673	-783	-0.681 4466	-0.676 2068	-668	-0.295 6043	-0.293 3316	-175
Feb. 1	0.660 6145	0.667 1105	776	0.670 9150	0.665 5718	685	0.291 0363	0.288 7187	184
2	0.673 5549	0.679 9472	769	0.660 1774	0.654 7323	701	0.286 3790	0.284 0172	192
3	0.686 2870	0.692 5738	761	0.649 2370	0.643 6920	718	0.281 6336	0.279 2285	200
4	0.698 8071	0.704 9866	753	0.638 0976	0.632 4542	734	0.276 8021	0.274 3544	209
5	+0.711 1118	+0.717 1824	-744	-0.626 7622	-0.621 0222	-750	-0.271 8857	-0.269 3961	-218
6	0.723 1980	0.729 1580	735	0.615 2346	0.609 3999	766	0.266 8858	0.264 3550	226
7	0.735 0620	0.740 9096	726	0.603 5184	0.597 5906	782	0.261 8040	0.259 2329	234
8	0.746 7004	0.752 4341	716	0.591 6171	0.585 5981	798	0.256 6419	0.254 0311	243
9	0.758 1102	0.763 7282	706	0.579 5342	0.573 4257	814	0.251 4007	0.248 7511	252
10	+0.769 2877	+0.774 7886	-695	-0.567 2731	-0.561 0768	-830	-0.246 0823	-0.243 3945	-260
11	0.780 2304	0.785 6124	684	0.554 8374	0.548 5553	845	0.240 6880	0.237 9629	268
12	0.790 9344	0.796 1960	672	0.542 2310	0.535 8648	860	0.235 2194	0.232 4578	277
13	0.801 3967	0.806 5363	660	0.529 4572	0.523 0089	875	0.229 6781	0.226 8807	286
14	0.811 6142	0.816 6300	647	0.516 5203	0.509 9916	890	0.224 0658	0.221 2335	294
15	+0.821 5833	+0.826 4739	-634	-0.503 4235	-0.496 8164	-904	-0.218 3841	-0.215 5177	-302
16	+0.831 3013	+0.836 0651	-621	-0.490 1709	-0.483 4874	-918	-0.212 6346	-0.209 7350	-310

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Feb. 16	+0.831 3013	+0.836 0651	-621	-0.490 1709	-0.483 4874	-918	-0.212 6346	-0.209 7350	-310
17	0.840 7648	0.845 4001	607	0.476 7665	0.470 0086	932	0.206 8192	0.203 8873	319
18	0.849 9706	0.854 4760	593	0.463 2144	0.456 3842	946	0.200 9396	0.197 9764	327
19	0.858 9158	0.863 2896	578	0.449 5187	0.442 6185	959	0.194 9979	0.192 0043	335
20	0.867 5970	0.871 8377	563	0.435 6841	0.428 7161	972	0.188 9958	0.185 9728	343
21	+0.876 0114	+0.880 1179	-548	-0.421 7150	-0.414 6814	-985	-0.182 9355	-0.179 8841	-351
22	0.884 1567	0.888 1276	532	0.407 6160	0.400 5192	998	0.176 8189	0.173 7402	359
23	0.892 0302	0.895 8643	516	0.393 3918	0.386 2345	1010	0.170 6482	0.167 5433	367
24	0.899 6296	0.903 3259	499	0.379 0477	0.371 8320	1022	0.164 4256	0.161 2954	374
25	0.906 9529	0.910 5105	482	0.364 5880	0.357 3165	1034	0.158 1531	0.154 9989	381
26	+0.913 9983	+0.917 4162	-465	-0.350 0181	-0.342 6933	-1046	-0.151 8330	-0.148 6557	-389
27	0.920 7640	0.924 0414	448	0.335 3427	0.327 9668	1057	0.145 4671	0.142 2676	397
28	0.927 2483	0.930 3845	430	0.320 5663	0.313 1416	1068	0.139 0575	0.135 8370	404
Mar. 1	0.933 4499	0.936 4444	412	0.305 6935	0.298 2226	1079	0.132 6064	0.129 3658	412
2	0.939 3677	0.942 2197	393	0.290 7293	0.283 2143	1089	0.126 1156	0.122 8559	419
3	+0.945 0003	+0.947 7092	-374	-0.275 6781	-0.268 1213	-1099	-0.119 5870	-0.116 3092	-426
4	0.950 3464	0.952 9117	355	0.260 5444	0.252 9482	1109	0.113 0228	0.109 7279	433
5	0.955 4050	0.957 8262	336	0.245 3332	0.237 6998	1118	0.106 4249	0.103 1139	440
6	0.960 1750	0.962 4513	316	0.230 0487	0.222 3804	1127	0.099 7952	0.096 4690	446
7	0.964 6551	0.966 7864	296	0.214 6954	0.206 9944	1136	0.093 1355	0.089 7951	453
8	+0.968 8450	+0.970 8306	-276	-0.199 2779	-0.191 5464	-1144	-0.086 4479	-0.083 0942	-459
9	0.972 7432	0.974 5826	256	0.183 8006	0.176 0409	1152	0.079 7342	0.076 3682	466
10	0.976 3489	0.978 0420	235	0.168 2680	0.160 4823	1159	0.072 9964	0.069 6190	472
11	0.979 6616	0.981 2078	214	0.152 6844	0.144 8749	1166	0.066 2363	0.062 8485	478
12	0.982 6804	0.984 0793	193	0.137 0543	0.129 2232	1173	0.059 4558	0.056 0586	484
13	+0.985 4044	+0.986 6556	-172	-0.121 3822	-0.113 5318	-1180	-0.052 6571	-0.049 2515	-490
14	0.987 8329	0.988 9360	150	0.105 6726	0.097 8051	1186	0.045 8420	0.042 4288	495
15	0.989 9650	0.990 9198	128	0.089 9299	0.082 0476	1192	0.039 0123	0.035 5927	501
16	0.991 8002	0.992 6062	106	0.074 1588	0.066 2640	1197	0.032 1703	0.028 7452	506
17	0.993 3377	0.993 9944	84	0.058 3638	0.050 4588	1203	0.025 3178	0.021 8883	511
18	+0.994 5765	+0.995 0839	-62	-0.042 5496	-0.034 6369	-1208	-0.018 4570	-0.015 0241	-516
19	0.995 5166	0.995 8745	39	0.026 7213	0.018 8033	1212	0.011 5900	0.008 1549	521
20	0.996 1575	0.996 3655	-16	-0.010 8836	-0.002 9628	1216	-0.004 7190	-0.001 2827	526
21	0.996 4986	0.996 5568	+7	+0.004 9584	+0.012 8795	1219	+0.002 1537	+0.005 5900	531
22	0.996 5402	0.996 4487	30	0.020 7997	0.028 7184	1222	0.009 0259	0.012 4612	535
23	+0.996 2823	+0.996 0411	+53	+0.036 6350	+0.044 5489	-1225	+0.015 8954	+0.019 3284	-539
24	0.995 7250	0.995 3343	77	0.052 4593	0.060 3657	1228	0.022 7599	0.026 1896	543
25	0.994 8691	0.994 3294	100	0.068 2674	0.076 1638	1230	0.029 6173	0.033 0426	547
26	0.993 7151	0.993 0266	124	0.084 0542	0.091 9381	1232	0.036 4652	0.039 8850	550
27	0.992 2642	0.991 4278	148	0.099 8149	0.107 6840	1234	0.043 3018	0.046 7151	554
28	+0.990 5176	+0.989 5335	+172	+0.115 5448	+0.123 3966	-1235	+0.050 1248	+0.053 5306	-557
29	0.988 4758	0.987 3448	196	0.131 2388	0.139 0710	1236	0.056 9322	0.060 3294	560
30	0.986 1405	0.984 8632	220	0.146 8925	0.154 7028	1237	0.063 7220	0.067 1098	563
31	0.983 5129	0.982 0898	244	0.162 5012	0.170 2873	1237	0.070 4924	0.073 8696	566
Apr. 1	0.980 5941	0.979 0260	269	0.178 0604	0.185 8201	1237	0.077 2412	0.080 6070	568
2	+0.977 3858	+0.975 6734	+294	+0.193 5659	+0.201 2970	-1236	+0.083 9667	+0.087 3202	-570
3	+0.973 8891	+0.972 0331	+318	+0.209 0130	+0.216 7134	-1235	+0.090 6671	+0.094 0072	-572

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Apr. 1	+0.980 5941	+0.979 0260	+ 269	+0.178 0604	+0.185 8201	-1237	+0.077 2412	+0.080 6070	-568
2	0.977 3858	0.975 6734	294	0.193 5659	0.201 2970	1236	0.083 9667	0.087 3202	570
3	0.973 8891	0.972 0331	318	0.209 0130	0.216 7134	1235	0.090 6671	0.094 0072	572
4	0.970 1056	0.968 1067	343	0.224 3976	0.232 0651	1234	0.097 3403	0.100 6663	574
5	0.966 0367	0.963 8958	368	0.239 7153	0.247 3478	1232	0.103 9848	0.107 2955	576
6	+0.961 6842	+0.959 4022	+ 392	+0.254 9620	+0.262 5574	-1230	+0.110 5984	+0.113 8932	-578
7	0.957 0498	0.954 6272	417	0.270 1335	0.277 6898	1228	0.117 1797	0.120 4575	579
8	0.952 1346	0.949 5721	442	0.285 2257	0.292 7409	1225	0.123 7266	0.126 9867	580
9	0.946 9400	0.944 2387	467	0.300 2347	0.307 7066	1222	0.130 2376	0.133 4790	581
10	0.941 4685	0.938 6293	493	0.315 1561	0.322 5828	1219	0.136 7108	0.139 9327	582
11	+0.935 7212	+0.932 7444	+ 518	+0.329 9862	+0.337 3657	-1215	+0.143 1444	+0.146 3459	-582
12	0.929 6993	0.926 5861	543	0.344 7208	0.352 0510	1211	0.149 5368	0.152 7169	583
13	0.923 4049	0.920 1560	568	0.359 3557	0.366 6345	1206	0.155 8859	0.159 0437	583
14	0.916 8396	0.913 4560	594	0.373 8869	0.381 1123	1201	0.162 1901	0.165 3248	583
15	0.910 0052	0.906 4874	619	0.388 3100	0.395 4797	1196	0.168 4474	0.171 5578	583
16	+0.902 9031	+0.899 2525	+ 644	+0.402 6208	+0.409 7328	-1190	+0.174 6568	+0.177 7412	-582
17	0.895 5359	0.891 7535	669	0.416 8151	0.423 8671	1184	0.180 8137	0.183 8730	581
18	0.887 9056	0.883 9923	694	0.430 8883	0.437 8783	1178	0.186 9189	0.189 9512	580
19	0.880 0139	0.875 9709	719	0.444 8363	0.451 7618	1171	0.192 9696	0.195 9738	579
20	0.871 8637	0.867 6925	744	0.458 6543	0.465 5134	1164	0.198 9637	0.201 9391	577
21	+0.863 4578	+0.859 1599	+ 769	+0.472 3384	+0.479 1288	-1157	+0.204 8996	+0.207 8451	-575
22	0.854 7990	0.850 3755	794	0.485 8841	0.492 6039	1149	0.210 7754	0.213 6902	573
23	0.845 8898	0.841 3425	820	0.499 2875	0.505 9345	1141	0.216 5892	0.219 4723	570
24	0.836 7340	0.832 0645	845	0.512 5444	0.519 1168	1133	0.222 3393	0.225 1900	568
25	0.827 3344	0.822 5442	870	0.525 6511	0.532 1469	1124	0.228 0242	0.230 8416	565
26	+0.817 6945	+0.812 7854	+ 895	+0.538 6038	+0.545 0212	-1115	+0.233 6421	+0.236 4255	-562
27	0.807 8174	0.802 7911	920	0.551 3988	0.557 7361	1105	0.239 1917	0.241 9404	559
28	0.797 7068	0.792 5648	945	0.564 0326	0.570 2880	1095	0.244 6714	0.247 3846	556
29	0.787 3657	0.782 1099	970	0.576 5018	0.582 6736	1085	0.250 0797	0.252 7567	553
30	0.776 7977	0.771 4295	995	0.588 8030	0.594 8897	1074	0.255 4153	0.258 0554	549
May 1	+0.766 0060	+0.760 5275	+1020	+0.600 9333	+0.606 9332	-1063	+0.260 6767	+0.263 2791	-545
2	0.754 9945	0.749 4073	1045	0.612 8892	0.618 8008	1052	0.265 8625	0.268 4268	541
3	0.743 7664	0.738 0721	1069	0.624 6677	0.630 4894	1040	0.270 9717	0.273 4970	536
4	0.732 3251	0.726 5257	1093	0.636 2657	0.641 9963	1028	0.276 0027	0.278 4886	531
5	0.720 6743	0.714 7713	1118	0.647 6807	0.653 3185	1015	0.280 9544	0.283 4000	526
6	+0.708 8171	+0.702 8122	+1142	+0.658 9094	+0.664 4532	-1002	+0.285 8254	+0.288 2303	-521
7	0.696 7569	0.690 6518	1166	0.669 9495	0.675 3977	989	0.290 6147	0.292 9783	516
8	0.684 4973	0.678 2938	1190	0.680 7977	0.686 1491	975	0.295 3209	0.297 6425	510
9	0.672 0418	0.665 7415	1214	0.691 4516	0.696 7048	961	0.299 9430	0.302 2221	504
10	0.659 3934	0.652 9979	1238	0.701 9084	0.707 0619	946	0.304 4796	0.306 7154	498
11	+0.646 5555	+0.640 0665	+1261	+0.712 1650	+0.717 2175	-931	+0.308 9294	+0.311 1214	-492
12	0.633 5315	0.626 9508	1285	0.722 2190	0.727 1691	916	0.313 2913	0.315 4388	486
13	0.620 3249	0.613 6542	1308	0.732 0673	0.736 9133	900	0.317 5638	0.319 6662	479
14	0.606 9392	0.600 1805	1331	0.741 7067	0.746 4473	884	0.321 7458	0.323 8024	472
15	0.593 3784	0.586 5334	1354	0.751 1346	0.755 7683	868	0.325 8359	0.327 8460	465
16	+0.579 6460	+0.572 7166	+1377	+0.760 3480	+0.764 8735	-851	+0.329 8326	+0.331 7957	-458
17	+0.565 7458	+0.558 7343	+1400	+0.769 3443	+0.773 7600	-834	+0.333 7351	+0.335 6505	-450

SUN, 1917.

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GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
May 17	+0.565 7458	+0.558 7343	+1400	+0.769 3443	+0.773 7600	-834	+0.333 7351	+0.335 6505	-450
18	0.551 6824	0.544 5907	1422	0.778 1202	0.782 4248	816	0.337 5419	0.339 4090	442
19	0.537 4598	0.530 2901	1444	0.786 6734	0.790 8655	798	0.341 2517	0.343 0700	434
20	0.523 0823	0.515 8370	1466	0.795 0010	0.799 0795	780	0.344 8636	0.346 6325	426
21	0.508 5547	0.501 2359	1488	0.803 1008	0.807 0644	761	0.348 3766	0.350 0956	417
22	+0.493 8813	+0.486 4913	+1509	+0.810 9701	+0.814 8177	-742	+0.351 7895	+0.353 4581	-409
23	0.479 0666	0.471 6078	1530	0.818 6069	0.822 3374	722	0.355 1014	0.356 7192	400
24	0.464 1156	0.456 5905	1551	0.826 0090	0.829 6214	702	0.358 3115	0.359 8781	391
25	0.449 0330	0.441 4437	1572	0.833 1744	0.836 6679	682	0.361 4189	0.362 9340	382
26	0.433 8232	0.426 1721	1592	0.840 1017	0.843 4754	661	0.364 4232	0.365 8863	373
27	+0.418 4909	+0.410 7802	+1612	+0.846 7888	+0.850 0419	-640	+0.367 3233	+0.368 7341	-363
28	0.403 0406	0.395 2728	1632	0.853 2343	0.856 3659	618	0.370 1186	0.371 4768	353
29	0.387 4772	0.379 6544	1652	0.859 4366	0.862 4462	596	0.372 8087	0.374 1140	343
30	0.371 8050	0.363 9296	1671	0.865 3946	0.868 2814	574	0.375 3928	0.376 6450	333
31	0.356 0288	0.348 1031	1690	0.871 1066	0.873 8700	551	0.377 8704	0.379 0691	322
June 1	+0.340 1531	+0.332 1794	+1709	+0.876 5714	+0.879 2107	-528	+0.380 2409	+0.381 3859	-312
2	0.324 1826	0.316 1631	1727	0.881 7879	0.884 3028	504	0.382 5040	0.383 5950	301
3	0.308 1214	0.300 0582	1745	0.886 7553	0.889 1453	480	0.384 6590	0.385 6960	290
4	0.291 9740	0.283 8694	1762	0.891 4726	0.893 7370	456	0.386 7057	0.387 6881	279
5	0.275 7449	0.267 6009	1779	0.895 9385	0.898 0769	431	0.388 6433	0.389 5712	268
6	+0.259 4381	+0.251 2569	+1796	+0.900 1521	+0.902 1641	-406	+0.390 4718	+0.391 3449	-256
7	0.243 0579	0.234 8415	1812	0.904 1128	0.905 9979	381	0.392 1905	0.393 0085	245
8	0.226 6084	0.218 3591	1828	0.907 8192	0.909 5767	355	0.393 7988	0.394 5615	233
9	0.210 0942	0.201 8141	1843	0.911 2701	0.912 8994	329	0.395 2965	0.396 0036	221
10	0.193 5194	0.185 2106	1858	0.914 4645	0.915 9654	302	0.396 6827	0.397 3339	209
11	+0.176 8884	+0.168 5532	+1873	+0.917 4018	+0.918 7735	-275	+0.397 9572	+0.398 5524	-197
12	0.160 2057	0.151 8464	1887	0.920 0803	0.921 3221	248	0.399 1194	0.399 6582	185
13	0.143 4760	0.135 0951	1901	0.922 4989	0.923 6106	221	0.400 1687	0.400 6508	173
14	0.126 7042	0.118 3040	1914	0.924 6571	0.925 6332	193	0.401 1046	0.401 5301	160
15	0.109 8950	0.101 4779	1927	0.926 5538	0.927 4038	165	0.401 9272	0.402 2957	147
16	+0.093 0534	+0.084 6220	+1939	+0.928 1881	+0.928 9068	-136	+0.402 6357	+0.402 9471	-134
17	0.076 1844	0.067 7413	1950	0.929 5596	0.930 1465	107	0.403 2299	0.403 4842	121
18	0.059 2932	0.050 8408	1961	0.930 6675	0.931 1226	78	0.403 7099	0.403 9069	108
19	0.042 3848	0.033 9257	1972	0.931 5116	0.931 8345	49	0.404 0753	0.404 2150	95
20	0.025 4643	0.017 0011	1982	0.932 0914	0.932 2824	-19	0.404 3260	0.404 4085	81
21	+0.008 5369	+0.000 0722	+1991	+0.932 4073	+0.932 4661	+11	+0.404 4623	+0.404 4875	-68
22	-0.008 3922	-0.016 8559	2000	0.932 4589	0.932 3857	41	0.404 4840	0.404 4519	54
23	0.025 3181	0.033 7783	2009	0.932 2466	0.932 0416	72	0.404 3912	0.404 3020	40
24	0.042 2359	0.050 6902	2017	0.931 7708	0.931 4341	103	0.404 1842	0.404 0380	26
25	0.059 1406	0.067 5865	2024	0.931 0316	0.930 5633	134	0.403 8633	0.403 6600	-12
26	-0.076 0272	-0.084 4622	+2031	+0.930 0295	+0.929 4302	+165	+0.403 4283	+0.403 1682	+2
27	0.092 8909	0.101 3127	2037	0.928 7655	0.928 0353	197	0.402 8798	0.402 5631	16
28	0.109 7269	0.118 1331	2042	0.927 2398	0.926 3791	229	0.402 2180	0.401 8446	30
29	0.126 5306	0.134 9188	2047	0.925 4533	0.924 4625	261	0.401 4431	0.401 0134	44
30	0.143 2972	0.151 6652	2051	0.923 4069	0.922 2864	293	0.400 5556	0.400 0697	59
July 1	-0.160 0222	-0.168 3677	+2055	+0.921 1012	+0.919 8514	+325	+0.399 5559	+0.399 0141	+73
2	-0.176 7011	-0.185 0219	+2058	+0.918 5373	+0.917 1589	+358	+0.398 4443	+0.397 8467	+88

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
July 1	-0.160 0222	-0.168 3677	+2055	+0.921 1012	+0.919 8514	+ 325	+0.399 5559	+0.399 0141	+ 73
2	0.176 7011	0.185 0219	2058	0.918 5373	0.917 1589	358	0.398 4443	0.397 8467	88
3	0.193 3296	0.201 6237	2060	0.915 7164	0.914 2098	391	0.397 2214	0.396 5682	102
4	0.209 9035	0.218 1686	2062	0.912 6392	0.911 0049	424	0.395 8871	0.395 1784	117
5	0.226 4184	0.234 6525	2063	0.909 3069	0.907 5451	457	0.394 4422	0.393 6784	131
6	-0.242 8703	-0.251 0713	+2063	+0.905 7197	+0.903 8309	+ 490	+0.392 8871	+0.392 0681	+146
7	0.259 2549	0.267 4206	2062	0.901 8789	0.899 8637	523	0.391 2216	0.390 3477	160
8	0.275 5678	0.283 6961	2061	0.897 7854	0.895 6440	557	0.389 4464	0.388 5178	175
9	0.291 8049	0.299 8936	2059	0.893 4397	0.891 1727	590	0.387 5618	0.386 5785	190
10	0.307 9616	0.316 0083	2057	0.888 8429	0.886 4504	624	0.385 5680	0.384 5302	205
11	-0.324 0332	-0.332 0357	+2054	+0.883 9955	+0.881 4783	+ 657	+0.383 4653	+0.382 3733	+220
12	0.340 0151	0.347 9709	2050	0.878 8989	0.876 2575	691	0.381 2543	0.380 1084	235
13	0.355 9026	0.363 8096	2045	0.873 5541	0.870 7888	725	0.378 9355	0.377 7357	250
14	0.371 6912	0.379 5469	2040	0.867 9618	0.865 0734	759	0.376 5091	0.375 2559	265
15	0.387 3759	0.395 1778	2034	0.862 1238	0.859 1130	793	0.373 9762	0.372 6700	280
16	-0.402 9519	-0.410 6977	+2027	+0.856 0414	+0.852 9092	+ 827	+0.371 3373	+0.369 9782	+295
17	0.418 4145	0.426 1018	2020	0.849 7166	0.846 4637	861	0.368 5929	0.367 1815	310
18	0.433 7589	0.441 3853	2012	0.843 1509	0.839 7782	894	0.365 7441	0.364 2807	325
19	0.448 9805	0.456 5439	2003	0.836 3459	0.832 8545	928	0.362 7915	0.361 2767	340
20	0.464 0749	0.471 5729	1993	0.829 3041	0.825 6949	962	0.359 7363	0.358 1704	355
21	-0.479 0373	-0.486 4676	+1983	+0.822 0272	+0.818 3014	+ 996	+0.356 5792	+0.354 9628	+370
22	0.493 8633	0.501 2238	1972	0.814 5177	0.810 6763	1029	0.353 3213	0.351 6548	384
23	0.508 5487	0.515 8374	1960	0.806 7776	0.802 8219	1063	0.349 9635	0.348 2474	399
24	0.523 0892	0.530 3036	1947	0.798 8095	0.794 7406	1096	0.346 5068	0.344 7418	414
25	0.537 4802	0.544 6186	1934	0.790 6158	0.786 4353	1129	0.342 9525	0.341 1390	429
26	-0.551 7181	-0.558 7783	+1920	+0.782 1994	+0.777 9082	+1162	+0.339 3016	+0.337 4403	+443
27	0.565 7987	0.572 7787	1905	0.773 5622	0.769 1616	1195	0.335 5553	0.333 6466	458
28	0.579 7179	0.586 6159	1889	0.764 7069	0.760 1985	1227	0.331 7144	0.329 7590	472
29	0.593 4723	0.600 2865	1873	0.755 6367	0.751 0218	1260	0.327 7805	0.325 7790	487
30	0.607 0580	0.613 7864	1856	0.746 3541	0.741 6341	1292	0.323 7546	0.321 7075	501
31	-0.620 4714	-0.627 1126	+1838	+0.736 8620	+0.732 0381	+1324	+0.319 6378	+0.317 5457	+516
Aug. 1	0.633 7094	0.640 2615	1820	0.727 1628	0.722 2365	1356	0.315 4312	0.313 2946	530
2	0.646 7684	0.653 2297	1801	0.717 2594	0.712 2318	1388	0.311 1360	0.308 9555	544
3	0.659 6450	0.666 0140	1781	0.707 1542	0.702 0269	1419	0.306 7533	0.304 5294	558
4	0.672 3361	0.678 6110	1760	0.696 8501	0.691 6240	1450	0.302 2840	0.300 0173	572
5	-0.684 8381	-0.691 0171	+1739	+0.686 3491	+0.681 0257	+1481	+0.297 7294	+0.295 4204	+586
6	0.697 1476	0.703 2291	1717	0.675 6542	0.670 2347	1512	0.293 0904	0.290 7396	600
7	0.709 2611	0.715 2433	1694	0.664 7676	0.659 2533	1542	0.288 3681	0.285 9760	613
8	0.721 1752	0.727 0561	1671	0.653 6920	0.648 0841	1572	0.283 5636	0.281 1309	627
9	0.732 8858	0.738 6638	1647	0.642 4300	0.636 7300	1601	0.278 6781	0.276 2053	640
10	-0.744 3897	-0.750 0628	+1622	+0.630 9844	+0.625 1938	+1630	+0.273 7127	+0.271 2006	+654
11	0.755 6828	0.761 2491	1597	0.619 3584	0.613 4785	1659	0.268 6691	0.266 1182	667
12	0.766 7614	0.772 2192	1571	0.607 5547	0.601 5873	1687	0.263 5482	0.260 9593	680
13	0.777 6221	0.782 9697	1544	0.595 5768	0.589 5237	1715	0.258 3517	0.255 7256	693
14	0.788 2615	0.793 4970	1516	0.583 4282	0.577 2907	1743	0.253 0812	0.250 4186	706
15	-0.798 6759	-0.803 7976	+1488	+0.571 1118	+0.564 8919	+1770	+0.247 7381	+0.245 0397	+718
16	-0.808 8619	-0.813 8684	+1459	+0.558 6315	+0.552 3309	+1797	+0.242 3236	+0.239 5902	+730

GREENWICH MEAN TIME.

Date.	X		Reduc. to Mean Eq'x of 1917.0.	Y		Reduc. to Mean Eq'x of 1917.0.	Z		Reduc. to Mean Eq'x of 1917.0.
	True Equinox.	True Equinox.		True Equinox.	True Equinox.		True Equinox.	True Equinox.	
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Aug. 16	-0.808 8619	-0.813 8684	+1459	+0.558 6315	+0.552 3309	+1797	+0.242 3236	+0.239 5902	+ 730
17	0.818 8164	0.823 7057	1430	0.545 9908	0.539 6115	1823	0.236 8397	0.234 0722	742
18	0.828 5360	0.833 3069	1400	0.533 1936	0.526 7374	1849	0.231 2880	0.228 4872	754
19	0.838 0179	0.842 6686	1369	0.520 2434	0.513 7123	1874	0.225 6700	0.222 8368	766
20	0.847 2588	0.851 7882	1338	0.507 1444	0.500 5401	1899	0.219 9878	0.217 1230	778
21	-0.856 2563	-0.860 6628	+1306	+0.493 9001	+0.487 2248	+1923	+0.214 2425	+0.211 3468	+ 789
22	0.865 0074	0.869 2898	1274	0.480 5147	0.473 7704	1946	0.208 4362	0.205 5108	801
23	0.873 5096	0.877 6665	1241	0.466 9923	0.460 1810	1969	0.202 5707	0.199 6162	812
24	0.881 7602	0.885 7905	1208	0.453 3369	0.446 4606	1991	0.196 6475	0.193 6649	823
25	0.889 7571	0.893 8597	1174	0.439 5526	0.432 6133	2013	0.190 6686	0.187 6587	833
26	-0.897 4980	-0.901 2717	+1139	+0.425 6434	+0.418 6433	+2035	+0.184 6356	+0.181 5994	+ 844
27	0.904 9806	0.908 6246	1104	0.411 6136	0.404 5547	2056	0.178 5504	0.175 4888	854
28	0.912 2034	0.915 7168	1068	0.397 4672	0.390 3515	2077	0.172 4147	0.169 3284	864
29	0.919 1645	0.922 5462	1032	0.383 2082	0.376 0377	2097	0.166 2300	0.163 1199	874
30	0.925 8619	0.929 1113	996	0.368 8406	0.361 6173	2116	0.159 9982	0.156 8651	884
31	-0.932 2940	-0.935 4099	+ 959	+0.354 3682	+0.347 0938	+2135	+0.153 7209	+0.150 5657	+ 893
Sept. 1	0.938 4589	0.941 4408	921	0.339 7947	0.332 4713	2153	0.147 3996	0.144 2230	902
2	0.944 3554	0.947 2024	883	0.325 1241	0.317 7536	2171	0.141 0360	0.137 8388	911
3	0.949 9815	0.952 6924	845	0.310 3601	0.302 9441	2188	0.134 6317	0.131 4148	920
4	0.955 3350	0.957 9091	806	0.295 5062	0.288 0468	2204	0.128 1883	0.124 9524	929
5	-0.960 4144	-0.962 8508	+ 767	+0.280 5665	+0.273 0656	+2219	+0.121 7074	+0.118 4535	+ 937
6	0.965 2180	0.967 5156	727	0.265 5447	0.258 0044	2234	0.115 1908	0.111 9196	945
7	0.969 7433	0.971 9010	687	0.250 4451	0.242 8673	2248	0.108 6403	0.105 3529	953
8	0.973 9884	0.976 0054	647	0.235 2715	0.227 6584	2262	0.102 0577	0.098 7550	960
9	0.977 9518	0.979 8274	606	0.220 0285	0.212 3822	2275	0.095 4449	0.092 1276	967
10	-0.981 6320	-0.983 3653	+ 565	+0.204 7201	+0.197 0428	+2287	+0.088 8036	+0.085 4730	+ 974
11	0.985 0271	0.986 6173	524	0.189 3510	0.181 6452	2299	0.082 1361	0.078 7931	981
12	0.988 1357	0.989 5820	482	0.173 9259	0.166 1936	2310	0.075 4442	0.072 0898	987
13	0.990 9561	0.992 2579	440	0.158 4489	0.150 6925	2320	0.068 7300	0.065 3651	993
14	0.993 4873	0.994 6441	398	0.142 9250	0.135 1409	2330	0.061 9954	0.058 6212	999
15	-0.995 7281	-0.996 7392	+ 355	+0.127 3587	+0.119 5612	+2339	+0.055 2427	+0.051 8602	+1004
16	0.997 6774	0.998 5426	312	0.111 7550	0.103 9405	2348	0.048 4739	0.045 0840	1009
17	0.999 3347	1.000 0534	269	0.096 1184	0.088 2894	2355	0.041 6908	0.038 2947	1014
18	1.000 6988	1.001 2709	226	0.080 4540	0.072 6128	2362	0.034 8953	0.031 4944	1019
19	1.001 7695	1.002 1945	182	0.064 7664	0.056 9153	2368	0.028 0909	0.024 6354	1023
20	-1.002 5460	-1.002 8240	+ 138	+0.049 0603	+0.041 2020	+2374	+0.021 2783	+0.017 8698	+1027
21	1.003 0285	1.003 1593	94	0.033 3410	0.025 4779	2379	0.014 4600	0.011 0492	1031
22	1.003 2164	1.003 1999	50	0.017 6132	+0.009 7475	2383	0.007 6379	+0.004 2262	1034
23	1.003 1099	1.002 9463	+ 6	+0.001 8814	-0.005 9845	2387	+0.000 8144	-0.002 5973	1037
24	1.002 7090	1.002 3982	- 39	-0.013 8495	0.021 7130	2390	-0.006 0086	0.009 4194	1040
25	-1.002 0138	-1.001 5560	- 84	-0.029 5746	-0.037 4337	+2392	-0.012 8293	-0.016 2381	+1042
26	1.001 0249	1.000 4205	129	0.045 2896	0.053 1418	2393	0.019 6456	0.023 0515	1044
27	0.999 7430	0.998 9922	174	0.060 9898	0.068 8331	2394	0.026 4555	0.029 8575	1046
28	0.998 1681	0.997 2710	219	0.076 6710	0.084 5030	2394	0.033 2572	0.036 6545	1047
29	0.996 3011	0.995 2582	264	0.092 3287	0.100 1475	2393	0.040 0490	0.043 4406	1049
30	-0.994 1423	-0.992 9534	- 309	-0.107 9588	-0.115 7621	+2392	-0.046 8290	-0.050 2139	+1050
Oct. 1	-0.991 6918	-0.990 3575	- 354	-0.123 5569	-0.131 3427	+2390	-0.053 5952	-0.056 9727	+1050

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Oct. 1	-0.991 6918	-0.990 3575	354	-0.123 5569	-0.131 3427	+2390	-0.053 5952	-0.056 9727	+1050
2	0.988 9505	0.987 4707	400	0.139 1189	0.146 8850	2387	0.060 3460	0.063 7150	1050
3	0.985 9184	0.984 2935	445	0.154 6406	0.162 3851	2383	0.067 0794	0.070 4390	1050
4	0.982 5960	0.980 8261	491	0.170 1178	0.177 8383	2379	0.073 7936	0.077 1429	1049
5	0.978 9839	0.977 0692	537	0.185 5459	0.193 2402	2374	0.080 4866	0.083 8245	1048
6	-0.975 0822	-0.973 0228	582	-0.200 9206	-0.208 5865	+2368	-0.087 1565	-0.090 4822	+1046
7	0.970 8913	0.968 6878	628	0.216 2372	0.223 8722	2362	0.093 8012	0.097 1135	1045
8	0.966 4124	0.964 0650	673	0.231 4909	0.239 0928	2355	0.100 4188	0.103 7167	1043
9	0.961 6458	0.959 1550	718	0.246 6773	0.254 2438	2347	0.107 0069	0.110 2894	1041
10	0.956 5926	0.953 9587	763	0.261 7916	0.269 3202	2339	0.113 5638	0.116 8298	1038
11	-0.951 2536	-0.948 4774	808	-0.276 8290	-0.284 3174	+2330	-0.120 0872	-0.123 3358	+1035
12	0.945 6302	0.942 7121	854	0.291 7848	0.299 2305	2320	0.126 5751	0.129 8050	1032
13	0.939 7235	0.936 6644	899	0.306 6540	0.314 0548	2309	0.133 0253	0.136 2357	1028
14	0.933 5352	0.930 3359	944	0.321 4322	0.328 7855	2298	0.139 4359	0.142 6256	1024
15	0.927 0668	0.923 7280	989	0.336 1143	0.343 4180	2286	0.145 8046	0.148 9728	1020
16	-0.920 3198	-0.916 8426	1034	-0.350 6959	-0.357 9475	+2274	-0.152 1297	-0.155 2751	+1015
17	0.913 2965	0.909 6817	1079	0.365 1721	0.372 3691	2261	0.158 4087	0.161 5304	1010
18	0.905 9985	0.902 2473	1124	0.379 5380	0.386 6782	2247	0.164 6399	0.167 7370	1004
19	0.898 4283	0.894 5417	1169	0.393 7891	0.400 8702	2232	0.170 8212	0.173 8925	998
20	0.890 5880	0.886 5673	1213	0.407 9209	0.414 9407	2217	0.176 9506	0.179 9952	992
21	-0.882 4800	-0.878 3265	1257	-0.421 9289	-0.428 8851	+2201	-0.183 0262	-0.186 0434	+ 985
22	0.874 1072	0.869 8223	1301	0.435 8087	0.442 6991	2185	0.189 0464	0.192 0350	978
23	0.865 4722	0.861 0573	1345	0.449 5559	0.456 3785	2168	0.195 0089	0.197 9681	971
24	0.856 5778	0.852 0340	1389	0.463 1665	0.469 9194	2150	0.200 9122	0.203 8412	963
25	0.847 4265	0.842 7556	1432	0.476 6366	0.483 3177	2131	0.206 7548	0.209 6527	955
26	-0.838 0215	-0.833 2246	1475	-0.489 9621	-0.496 5695	+2111	-0.212 5348	-0.215 4007	+ 947
27	0.828 3654	0.823 4441	1518	0.503 1392	0.509 6709	2091	0.218 2504	0.221 0837	939
28	0.818 4610	0.813 4166	1561	0.516 1642	0.522 6186	2070	0.223 9003	0.226 7002	930
29	0.808 3113	0.803 1452	1603	0.529 0337	0.535 4090	2049	0.229 4830	0.232 2486	921
30	0.797 9187	0.792 6322	1645	0.541 7439	0.548 0380	2027	0.234 9967	0.237 7271	911
31	-0.787 2862	-0.781 8809	1687	-0.554 2909	-0.560 5023	+2004	-0.240 4397	-0.243 1344	+ 901
Nov. 1	0.776 4166	0.770 8935	1728	0.566 6716	0.572 7983	1981	0.245 8108	0.248 4688	891
2	0.765 3121	0.759 6728	1769	0.578 8820	0.584 9221	1957	0.251 1080	0.253 7283	880
3	0.753 9760	0.748 2219	1810	0.590 9182	0.596 8699	1933	0.256 3295	0.258 9115	869
4	0.742 4109	0.736 5433	1851	0.602 7767	0.608 6380	1908	0.261 4741	0.264 0169	858
5	-0.730 6198	-0.724 6407	1891	-0.614 4535	-0.620 2226	+1882	-0.266 5398	-0.269 0426	+ 846
6	0.718 6061	0.712 5166	1931	0.625 9449	0.631 6199	1855	0.271 5251	0.273 9869	834
7	0.706 3726	0.700 1746	1971	0.637 2470	0.642 8259	1828	0.276 4280	0.278 8482	821
8	0.693 9229	0.687 6180	2010	0.648 3560	0.653 8369	1800	0.281 2471	0.283 6246	809
9	0.681 2606	0.674 8509	2049	0.659 2681	0.664 6493	1772	0.285 9806	0.288 3149	796
10	-0.668 3894	-0.661 8764	2087	-0.669 9798	-0.675 2592	+1743	-0.290 6271	-0.292 9172	+ 783
11	0.655 3126	0.648 6984	2125	0.680 4871	0.685 6631	1713	0.295 1848	0.297 4299	769
12	0.642 0344	0.635 3210	2162	0.690 7866	0.695 8572	1682	0.299 6522	0.301 8515	755
13	0.628 5587	0.621 7479	2199	0.700 8745	0.705 8380	1651	0.304 0277	0.306 1805	741
14	0.614 8894	0.607 9836	2236	0.710 7473	0.715 6021	1619	0.308 3097	0.310 4153	726
15	-0.601 0311	-0.594 0324	2272	-0.720 4020	-0.725 1464	+1587	-0.312 4971	-0.314 5547	+ 711
16	-0.586 9882	-0.579 8989	2308	-0.729 8350	-0.734 4673	+1554	-0.316 5880	-0.318 5970	+ 696

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1917.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1917.0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Nov. 16	-0.586 9882	-0.579 8989	-2308	-0.729 8350	-0.734 4673	+1554	-0.316 5880	-0.318 5970	+696
17	0.572 7652	0.565 5875	2343	0.739 0429	0.743 5615	1521	0.320 5814	0.322 5410	680
18	0.558 3665	0.551 1028	2378	0.748 0226	0.752 4261	1487	0.324 4758	0.326 3856	664
19	0.543 7969	0.536 4495	2412	0.756 7717	0.761 0588	1452	0.328 2702	0.330 1294	648
20	0.529 0611	0.521 6325	2445	0.765 2871	0.769 4563	1416	0.331 9631	0.333 7713	632
21	-0.514 1641	-0.506 6566	-2478	-0.773 5662	-0.777 6165	+1380	-0.335 5538	-0.337 3105	+615
22	0.499 1105	0.491 5265	2510	0.781 6068	0.785 5369	1343	0.339 0412	0.340 7458	598
23	0.483 9051	0.476 2469	2542	0.789 4065	0.793 2153	1306	0.342 4242	0.344 0762	581
24	0.468 5526	0.460 8226	2573	0.796 9631	0.800 6495	1268	0.345 7018	0.347 3009	564
25	0.453 0575	0.445 2580	2604	0.804 2742	0.807 8372	1230	0.348 8733	0.350 4189	546
26	-0.437 4246	-0.429 5578	-2634	-0.811 3382	-0.814 7769	+1191	-0.351 9376	-0.353 4294	+528
27	0.421 6583	0.413 7267	2664	0.818 1530	0.821 4664	1152	0.354 8941	0.356 3316	510
28	0.406 7635	0.397 7692	2693	0.824 7169	0.827 9042	1112	0.357 7418	0.359 1245	491
29	0.389 7442	0.381 6892	2721	0.831 0279	0.834 0878	1071	0.360 4797	0.361 8074	472
30	0.373 6049	0.365 4918	2748	0.837 0836	0.840 0153	1030	0.363 1073	0.364 3793	453
Dec. 1	-0.357 3505	-0.349 1816	-2775	-0.842 8826	-0.845 6851	+ 983	-0.365 6233	-0.366 8392	+434
2	0.340 9854	0.332 7626	2801	0.848 4226	0.851 0949	946	0.368 0269	0.369 1863	415
3	0.324 5140	0.316 2402	2826	0.853 7018	0.856 2430	903	0.370 3173	0.371 4199	395
4	0.307 9416	0.299 6188	2851	0.858 7183	0.861 1273	860	0.372 4938	0.373 5389	375
5	0.291 2725	0.282 9034	2875	0.863 4699	0.865 7460	816	0.374 5552	0.375 5426	355
6	-0.274 5122	-0.266 0994	-2898	-0.867 9552	-0.870 0974	+ 771	-0.376 5010	-0.377 4302	+335
7	0.257 6656	0.249 2114	2921	0.872 1723	0.874 1796	726	0.378 3302	0.379 2009	315
8	0.240 7376	0.232 2448	2942	0.876 1193	0.877 9911	681	0.380 0422	0.380 8541	294
9	0.223 7336	0.215 2047	2963	0.879 7949	0.881 5305	635	0.381 6364	0.382 3890	273
10	0.206 6588	0.198 0965	2983	0.883 1976	0.884 7961	589	0.383 1119	0.383 8051	252
11	-0.189 5186	-0.180 9257	-3002	-0.886 3258	-0.887 7864	+ 542	-0.384 4684	-0.385 1017	+231
12	0.172 3185	0.163 6977	3020	0.889 1779	0.890 5002	495	0.385 7050	0.386 2783	210
13	0.155 0640	0.146 4181	3037	0.891 7531	0.892 9365	447	0.386 8214	0.387 3343	188
14	0.137 7608	0.129 0928	3053	0.894 0503	0.895 0944	399	0.387 8170	0.388 2694	166
15	0.120 4148	0.111 7274	3069	0.896 0687	0.896 9729	350	0.388 6915	0.389 0233	144
16	-0.103 0314	-0.094 3277	-3084	-0.897 8070	-0.898 5710	+ 301	-0.389 4448	-0.389 7758	+122
17	0.085 6168	0.076 8995	3098	0.899 2648	0.899 8884	252	0.390 0764	0.390 3467	100
18	0.068 1766	0.059 4488	3111	0.900 4419	0.900 9252	202	0.390 5865	0.390 7958	78
19	0.050 7167	0.041 9810	3123	0.901 3383	0.901 6811	152	0.390 9747	0.391 1232	55
20	0.033 2425	0.024 5018	3134	0.901 9536	0.902 1560	101	0.391 2413	0.391 3290	33
21	-0.015 7597	-0.007 0168	-3144	-0.902 2882	-0.902 3504	+ 50	-0.391 3863	-0.391 4133	+ 10
22	+0.001 7263	+0.010 4688	3153	0.902 3424	0.902 2643	- 1	0.391 4099	0.391 3761	- 12
23	0.019 2101	0.027 9495	3161	0.902 1162	0.901 8983	52	0.391 3119	0.391 2175	35
24	0.036 6864	0.045 4202	3168	0.901 6104	0.901 2525	104	0.391 0928	0.390 9378	58
25	0.054 1501	0.062 8756	3174	0.900 8249	0.900 3274	156	0.390 7525	0.390 5370	81
26	+0.071 5960	+0.080 3106	-3179	-0.899 7602	-0.899 1234	- 208	-0.390 2913	-0.390 0154	-104
27	0.089 0189	0.097 7203	3183	0.898 4170	0.897 6410	260	0.389 7093	0.389 3730	127
28	0.106 4141	0.115 0997	3186	0.896 7956	0.895 8309	313	0.389 0065	0.388 6100	150
29	0.123 7764	0.132 4436	3188	0.894 8969	0.893 8434	366	0.388 1835	0.387 7269	173
30	0.141 1006	0.149 7469	3190	0.892 7205	0.891 5286	419	0.387 2403	0.386 7236	196
31	+0.158 3817	+0.167 0045	-3189	-0.890 2678	-0.888 9379	- 472	-0.386 1769	-0.385 6002	-220
32	+0.175 6146	+0.184 2114	-3183	-0.887 5389	-0.886 0710	- 526	-0.384 9935	-0.384 3570	-243

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 1.					JANUARY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 16 27.05	2.0961	+13 47 14.9	+12.285	0	2 59 24.21	2.1993	+21 50 52.4	+7.576
1	1 18 32.87	2.0978	13 59 29.7	12.207	1	3 1 36.24	2.2015	21 58 23.5	7.460
2	1 20 38.78	2.0993	14 11 39.7	12.126	2	3 3 48.39	2.2037	22 5 47.6	7.344
3	1 22 44.79	2.1010	14 23 44.8	12.045	3	3 6 0.68	2.2059	22 13 4.8	7.228
4	1 24 50.90	2.1027	14 35 45.1	11.963	4	3 8 13.10	2.2081	22 20 15.0	7.111
5	1 26 57.11	2.1043	14 47 40.3	11.879	5	3 10 25.65	2.2103	22 27 18.1	6.993
6	1 29 3.42	2.1062	14 59 30.6	11.796	6	3 12 38.33	2.2123	22 34 14.2	6.875
7	1 31 9.85	2.1080	15 11 15.8	11.712	7	3 14 51.13	2.2144	22 41 3.1	6.756
8	1 33 16.38	2.1098	15 22 56.0	11.626	8	3 17 4.06	2.2165	22 47 44.9	6.637
9	1 35 23.03	2.1118	15 34 30.9	11.539	9	3 19 17.11	2.2185	22 54 19.5	6.517
10	1 37 29.79	2.1136	15 46 0.7	11.453	10	3 21 30.28	2.2205	23 0 46.9	6.397
11	1 39 36.66	2.1155	15 57 25.2	11.364	11	3 23 43.57	2.2224	23 7 7.1	6.276
12	1 41 43.65	2.1175	16 8 44.4	11.275	12	3 25 56.97	2.2243	23 13 20.0	6.154
13	1 43 50.76	2.1196	16 19 58.2	11.186	13	3 28 10.49	2.2263	23 19 25.6	6.033
14	1 45 58.00	2.1216	16 31 6.7	11.096	14	3 30 24.12	2.2281	23 25 23.9	5.911
15	1 48 5.35	2.1236	16 42 9.7	11.004	15	3 32 37.86	2.2299	23 31 14.9	5.788
16	1 50 12.83	2.1258	16 53 7.2	10.913	16	3 34 51.71	2.2317	23 36 58.5	5.665
17	1 52 20.44	2.1279	17 3 59.2	10.819	17	3 37 5.66	2.2334	23 42 34.7	5.541
18	1 54 28.18	2.1301	17 14 45.5	10.725	18	3 39 19.72	2.2351	23 48 3.4	5.417
19	1 56 36.05	2.1322	17 25 26.2	10.632	19	3 41 33.87	2.2367	23 53 24.7	5.293
20	1 58 44.04	2.1343	17 36 1.3	10.537	20	3 43 48.12	2.2383	23 58 38.5	5.168
21	2 0 52.17	2.1367	17 46 30.6	10.441	21	3 46 2.46	2.2398	24 3 44.8	5.042
22	2 3 0.44	2.1388	17 56 54.2	10.344	22	3 48 16.89	2.2413	24 8 43.5	4.917
23	2 5 8.83	2.1411	+18 7 11.9	+10.246	23	3 50 31.41	2.2428	+24 13 34.8	+4.791
JANUARY 2.					JANUARY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 7 17.37	2.1434	+18 17 23.7	+10.148	0	3 52 46.02	2.2442	+24 18 18.4	+4.664
1	2 9 26.04	2.1457	18 27 29.6	10.049	1	3 55 0.71	2.2455	24 22 54.5	4.538
2	2 11 34.85	2.1480	18 37 29.6	9.949	2	3 57 15.48	2.2468	24 27 22.9	4.410
3	2 13 43.80	2.1503	18 47 23.5	9.848	3	3 59 30.32	2.2479	24 31 43.7	4.283
4	2 15 52.89	2.1527	18 57 11.4	9.748	4	4 1 45.23	2.2492	24 35 56.9	4.155
5	2 18 2.12	2.1549	19 6 53.2	9.646	5	4 4 0.22	2.2503	24 40 2.3	4.027
6	2 20 11.48	2.1573	19 16 28.9	9.543	6	4 6 15.26	2.2513	24 44 0.1	3.899
7	2 22 20.99	2.1597	19 25 58.4	9.439	7	4 8 30.37	2.2523	24 47 50.2	3.771
8	2 24 30.64	2.1620	19 35 21.6	9.335	8	4 10 45.54	2.2533	24 51 32.6	3.642
9	2 26 40.43	2.1643	19 44 38.6	9.230	9	4 13 0.76	2.2541	24 55 7.2	3.513
10	2 28 50.36	2.1667	19 53 49.2	9.125	10	4 15 16.03	2.2549	24 58 34.1	3.384
11	2 31 0.43	2.1691	20 2 53.6	9.018	11	4 17 31.35	2.2556	25 1 53.3	3.254
12	2 33 10.65	2.1715	20 11 51.4	8.911	12	4 19 46.70	2.2563	25 5 4.6	3.124
13	2 35 21.01	2.1738	20 20 42.9	8.803	13	4 22 2.10	2.2569	25 8 8.2	2.994
14	2 37 31.51	2.1762	20 29 27.8	8.695	14	4 24 17.53	2.2575	25 11 3.9	2.864
15	2 39 42.15	2.1786	20 38 6.3	8.587	15	4 26 33.00	2.2581	25 13 51.9	2.734
16	2 41 52.94	2.1809	20 46 38.2	8.477	16	4 28 48.50	2.2584	25 16 32.0	2.603
17	2 44 3.86	2.1832	20 55 3.5	8.366	17	4 31 4.01	2.2588	25 19 4.3	2.473
18	2 46 14.92	2.1856	21 3 22.1	8.255	18	4 33 19.55	2.2591	25 21 28.8	2.343
19	2 48 26.13	2.1879	21 11 34.1	8.144	19	4 35 35.10	2.2593	25 23 45.5	2.213
20	2 50 37.47	2.1902	21 19 39.4	8.032	20	4 37 50.67	2.2595	25 25 54.3	2.082
21	2 52 48.95	2.1925	21 27 37.9	7.918	21	4 40 6.24	2.2595	25 27 55.3	1.952
22	2 55 0.57	2.1948	21 35 29.6	7.804	22	4 42 21.81	2.2596	25 29 48.5	1.821
23	2 57 12.32	2.1970	21 43 14.4	7.690	23	4 44 37.39	2.2595	25 31 33.8	1.689
24	2 59 24.21	2.1993	+21 50 52.4	+7.576	24	4 46 52.95	2.2593	+25 33 11.2	+1.538

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 5.					JANUARY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 46 52.95	2.2593	+25 33 11.2	+1.558	0	6 33 49.86	2.1715	+24 20 31.0	-4.453
1	4 49 8.51	2.2592	25 34 40.8	1.428	1	6 36 0.05	2.1682	24 16 0.4	4.568
2	4 51 24.05	2.2588	25 36 2.5	1.297	2	6 38 10.04	2.1649	24 11 22.9	4.681
3	4 53 39.57	2.2586	25 37 16.4	1.166	3	6 40 19.84	2.1615	24 6 38.7	4.793
4	4 55 55.08	2.2582	25 38 22.4	1.035	4	6 42 29.42	2.1581	24 1 47.7	4.906
5	4 58 10.55	2.2576	25 39 20.6	0.905	5	6 44 38.81	2.1547	23 56 50.0	5.018
6	5 0 25.99	2.2571	25 40 11.0	0.774	6	6 46 47.98	2.1511	23 51 45.6	5.128
7	5 2 41.40	2.2564	25 40 53.5	0.643	7	6 48 56.94	2.1476	23 46 34.6	5.238
8	5 4 56.76	2.2557	25 41 28.2	0.513	8	6 51 5.69	2.1440	23 41 17.0	5.348
9	5 7 12.08	2.2549	25 41 55.1	0.383	9	6 53 14.22	2.1404	23 35 52.8	5.457
10	5 9 27.35	2.2541	25 42 14.1	0.253	10	6 55 22.54	2.1368	23 30 22.2	5.564
11	5 11 42.57	2.2532	25 42 25.4	+0.123	11	6 57 30.64	2.1331	23 24 45.1	5.672
12	5 13 57.73	2.2522	25 42 28.8	-0.008	12	6 59 38.51	2.1294	23 19 1.6	5.778
13	5 16 12.83	2.2511	25 42 24.5	0.138	13	7 1 46.17	2.1258	23 13 11.7	5.884
14	5 18 27.86	2.2498	25 42 12.3	0.267	14	7 3 53.60	2.1219	23 7 15.5	5.989
15	5 20 42.81	2.2487	25 41 52.5	0.396	15	7 6 0.80	2.1182	23 1 13.0	6.093
16	5 22 57.70	2.2474	25 41 24.8	0.525	16	7 8 7.78	2.1144	22 55 4.3	6.198
17	5 25 12.50	2.2460	25 40 49.5	0.653	17	7 10 14.53	2.1106	22 48 49.3	6.301
18	5 27 27.22	2.2446	25 40 6.4	0.783	18	7 12 21.04	2.1067	22 42 28.2	6.402
19	5 29 41.85	2.2431	25 39 15.6	0.911	19	7 14 27.33	2.1028	22 36 1.1	6.503
20	5 31 56.39	2.2415	25 38 17.1	1.038	20	7 16 33.38	2.0989	22 29 27.8	6.604
21	5 34 10.83	2.2398	25 37 11.0	1.166	21	7 18 39.20	2.0951	22 22 48.6	6.704
22	5 36 25.17	2.2382	25 35 57.2	1.293	22	7 20 44.79	2.0912	22 16 3.3	6.803
23	5 38 39.41	2.2364	+25 34 35.8	-1.421	23	7 22 50.14	2.0872	+22 9 12.2	-6.901
JANUARY 6.					JANUARY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 40 53.54	2.2345	+25 33 6.7	-1.548	0	7 24 55.25	2.0833	+22 2 15.2	-6.998
1	5 43 7.55	2.2326	25 31 30.1	1.674	1	7 27 0.13	2.0793	21 55 12.4	7.095
2	5 45 21.45	2.2307	25 29 45.8	1.800	2	7 29 4.76	2.0753	21 48 3.8	7.192
3	5 47 35.23	2.2286	25 27 54.1	1.926	3	7 31 9.16	2.0713	21 40 49.4	7.287
4	5 49 48.88	2.2264	25 25 54.7	2.052	4	7 33 13.31	2.0673	21 33 29.4	7.380
5	5 52 2.40	2.2243	25 23 47.9	2.175	5	7 35 17.23	2.0633	21 26 3.8	7.473
6	5 54 15.79	2.2220	25 21 33.7	2.300	6	7 37 20.91	2.0593	21 18 32.6	7.567
7	5 56 29.04	2.2197	25 19 11.9	2.424	7	7 39 24.34	2.0553	21 10 55.8	7.668
8	5 58 42.15	2.2173	25 16 42.8	2.548	8	7 41 27.54	2.0513	21 3 13.6	7.749
9	6 0 55.11	2.2148	25 14 6.2	2.671	9	7 43 30.49	2.0473	20 55 25.9	7.840
10	6 3 7.93	2.2124	25 11 22.3	2.793	10	7 45 33.21	2.0433	20 47 32.8	7.929
11	6 5 20.60	2.2098	25 8 31.0	2.916	11	7 47 35.68	2.0392	20 39 34.4	8.017
12	6 7 33.10	2.2071	25 5 32.4	3.037	12	7 49 37.91	2.0352	20 31 30.8	8.104
13	6 9 45.45	2.2045	25 2 26.6	3.158	13	7 51 39.90	2.0312	20 23 21.9	8.192
14	6 11 57.64	2.2018	24 59 13.5	3.279	14	7 53 41.65	2.0272	20 15 7.8	8.278
15	6 14 9.66	2.1989	24 55 53.1	3.399	15	7 55 43.16	2.0231	20 6 48.5	8.364
16	6 16 21.51	2.1961	24 52 25.6	3.518	16	7 57 44.42	2.0191	19 58 24.1	8.448
17	6 18 33.19	2.1932	24 48 51.0	3.637	17	7 59 45.45	2.0152	19 49 54.7	8.532
18	6 20 44.69	2.1903	24 45 9.2	3.755	18	8 1 46.24	2.0112	19 41 20.3	8.614
19	6 22 56.02	2.1873	24 41 20.4	3.873	19	8 3 46.79	2.0072	19 32 41.0	8.697
20	6 25 7.16	2.1842	24 37 24.5	3.991	20	8 5 47.10	2.0032	19 23 56.7	8.778
21	6 27 18.12	2.1811	24 33 21.5	4.108	21	8 7 47.17	1.9993	19 15 7.7	8.858
22	6 29 28.89	2.1779	24 29 11.6	4.223	22	8 9 47.01	1.9953	19 6 13.8	8.938
23	6 31 39.47	2.1748	24 24 54.7	4.338	23	8 11 46.61	1.9914	18 57 15.2	9.016
24	6 33 49.86	2.1715	+24 20 31.0	-4.463	24	8 13 45.98	1.9875	+18 48 11.9	-9.094

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 9.					JANUARY 11.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	8 13 45.98	1.9875	+18 48 11.9	-9.064	0	9 45 11.23	1.8361	+10 17 22.6	-11.890
1	8 15 45.11	1.9837	18 39 3.9	9.171	1	9 47 1.33	1.8340	10 5 28.0	11.929
2	8 17 44.02	1.9798	18 29 51.4	9.247	2	9 48 51.31	1.8320	9 53 31.1	11.968
3	8 19 42.69	1.9759	18 20 34.3	9.323	3	9 50 41.17	1.8300	9 41 31.9	12.006
4	8 21 41.13	1.9721	18 11 12.7	9.397	4	9 52 30.91	1.8280	9 29 30.4	12.044
5	8 23 39.34	1.9683	18 1 46.7	9.471	5	9 54 20.53	1.8261	9 17 26.6	12.081
6	8 25 37.32	1.9644	17 52 16.2	9.544	6	9 56 10.04	1.8243	9 5 20.7	12.116
7	8 27 35.07	1.9607	17 42 41.4	9.616	7	9 57 59.45	1.8226	8 53 12.7	12.152
8	8 29 32.60	1.9570	17 33 2.3	9.687	8	9 59 48.75	1.8208	8 41 2.5	12.187
9	8 31 29.91	1.9533	17 23 19.0	9.758	9	10 1 37.95	1.8192	8 28 50.3	12.221
10	8 33 26.99	1.9495	17 13 31.4	9.828	10	10 3 27.05	1.8176	8 16 26.0	12.254
11	8 35 23.85	1.9458	17 3 39.7	9.896	11	10 5 16.06	1.8161	8 4 19.8	12.286
12	8 37 20.49	1.9422	16 53 44.0	9.963	12	10 7 4.98	1.8146	7 52 1.7	12.318
13	8 39 16.91	1.9386	16 43 44.1	10.031	13	10 8 53.81	1.8131	7 39 41.7	12.349
14	8 41 13.12	1.9350	16 33 40.3	10.098	14	10 10 42.55	1.8118	7 27 19.8	12.380
15	8 43 9.11	1.9314	16 23 32.4	10.163	15	10 12 31.22	1.8104	7 14 56.1	12.409
16	8 45 4.89	1.9279	16 13 20.7	10.228	16	10 14 19.80	1.8092	7 2 30.7	12.438
17	8 47 0.46	1.9244	16 3 5.1	10.293	17	10 16 8.32	1.8080	6 50 3.5	12.467
18	8 48 55.82	1.9210	15 52 45.6	10.355	18	10 17 56.76	1.8068	6 37 34.7	12.494
19	8 50 50.98	1.9176	15 42 22.5	10.417	19	10 19 45.14	1.8058	6 25 4.2	12.522
20	8 52 45.93	1.9142	15 31 55.6	10.479	20	10 21 33.45	1.8047	6 12 32.1	12.548
21	8 54 40.68	1.9108	15 21 25.0	10.540	21	10 23 21.70	1.8038	5 59 58.4	12.572
22	8 56 35.23	1.9075	15 10 50.8	10.600	22	10 25 9.90	1.8029	5 47 23.3	12.596
23	8 58 29.58	1.9042	+15 0 13.0	-10.658	23	10 26 58.05	1.8021	+ 5 34 46.6	-12.623
JANUARY 10.					JANUARY 12.				
0	9 0 23.73	1.9009	+14 49 31.8	-10.717	0	10 28 46.15	1.8013	+ 5 22 8.5	-12.647
1	9 2 17.69	1.8978	14 38 47.0	10.775	1	10 30 34.21	1.8006	5 9 29.0	12.670
2	9 4 11.46	1.8946	14 27 58.8	10.832	2	10 32 22.22	1.7999	4 56 48.1	12.692
3	9 6 5.04	1.8915	14 17 7.2	10.888	3	10 34 10.20	1.7993	4 44 6.0	12.713
4	9 7 58.44	1.8884	14 6 12.3	10.943	4	10 35 58.14	1.7988	4 31 22.5	12.735
5	9 9 51.65	1.8853	13 55 14.0	10.998	5	10 37 46.06	1.7984	4 18 37.8	12.755
6	9 11 44.68	1.8823	13 44 12.6	11.051	6	10 39 33.95	1.7979	4 5 51.9	12.774
7	9 13 37.53	1.8793	13 33 7.9	11.105	7	10 41 21.81	1.7976	3 53 4.9	12.793
8	9 15 30.20	1.8764	13 22 0.0	11.157	8	10 43 9.66	1.7974	3 40 16.7	12.812
9	9 17 22.70	1.8736	13 10 49.1	11.208	9	10 44 57.50	1.7972	3 27 27.5	12.829
10	9 19 15.03	1.8708	12 59 35.1	11.258	10	10 46 45.32	1.7970	3 14 37.2	12.847
11	9 21 7.19	1.8680	12 48 18.1	11.308	11	10 48 33.14	1.7969	3 1 45.9	12.863
12	9 22 59.19	1.8653	12 36 58.1	11.358	12	10 50 20.95	1.7969	2 48 53.7	12.878
13	9 24 51.02	1.8626	12 25 35.2	11.406	13	10 52 8.77	1.7970	2 36 0.6	12.893
14	9 26 42.70	1.8599	12 14 9.4	11.454	14	10 53 56.59	1.7971	2 23 6.5	12.908
15	9 28 34.21	1.8573	12 2 40.7	11.501	15	10 55 44.42	1.7973	2 10 11.7	12.921
16	9 30 25.57	1.8548	11 51 9.3	11.547	16	10 57 32.27	1.7976	1 57 16.0	12.934
17	9 32 16.78	1.8523	11 39 35.1	11.593	17	10 59 20.13	1.7979	1 44 19.6	12.946
18	9 34 7.84	1.8498	11 27 58.2	11.637	18	11 1 8.02	1.7983	1 31 22.5	12.958
19	9 35 58.75	1.8473	11 16 18.7	11.681	19	11 2 55.93	1.7988	1 18 24.7	12.969
20	9 37 49.52	1.8450	11 4 36.5	11.724	20	11 4 43.87	1.7993	1 5 26.2	12.979
21	9 39 40.15	1.8427	10 52 51.8	11.767	21	11 6 31.84	1.7999	0 52 27.2	12.988
22	9 41 30.64	1.8404	10 41 4.5	11.808	22	11 8 19.86	1.8006	0 39 27.6	12.998
23	9 43 21.00	1.8383	10 29 14.8	11.849	23	11 10 7.91	1.8013	0 26 27.5	13.006
24	9 45 11.23	1.8361	+10 17 22.6	-11.890	24	11 11 56.01	1.8021	+ 0 13 26.9	-13.014

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 13.					JANUARY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 11 56.01	1.8021	+ 0 13 26.9	-13.014	0	12 40 43.09	1.9257	-10 6 24.1	-12.520
1	11 13 44.16	1.8030	+ 0 0 25.8	13.021	1	12 42 38.76	1.9301	10 18 54.4	12.490
2	11 15 32.37	1.8039	- 0 12 35.6	13.027	2	12 44 34.70	1.9346	10 31 22.9	12.458
3	11 17 20.63	1.8049	0 25 37.4	13.033	3	12 46 30.91	1.9392	10 43 49.4	12.426
4	11 19 8.96	1.8060	0 38 39.5	13.037	4	12 48 27.40	1.9438	10 56 14.0	12.393
5	11 20 57.35	1.8072	0 51 41.8	13.041	5	12 50 24.16	1.9484	11 8 36.6	12.359
6	11 22 45.82	1.8083	1 4 44.4	13.045	6	12 52 21.21	1.9533	11 20 57.1	12.324
7	11 24 34.35	1.8096	1 17 47.2	13.048	7	12 54 18.55	1.9582	11 33 15.5	12.288
8	11 26 22.97	1.8110	1 30 50.1	13.049	8	12 56 16.19	1.9631	11 45 31.7	12.252
9	11 28 11.67	1.8124	1 43 53.1	13.051	9	12 58 14.12	1.9680	11 57 45.7	12.214
10	11 30 0.46	1.8140	1 56 56.2	13.052	10	13 0 12.35	1.9732	12 9 57.4	12.174
11	11 31 49.35	1.8155	2 9 59.3	13.051	11	13 2 10.90	1.9783	12 22 6.6	12.133
12	11 33 38.32	1.8171	2 23 2.3	13.050	12	13 4 9.75	1.9835	12 34 13.4	12.093
13	11 35 27.40	1.8188	2 36 5.3	13.049	13	13 6 8.92	1.9888	12 46 17.8	12.051
14	11 37 16.58	1.8207	2 49 8.2	13.048	14	13 8 8.41	1.9943	12 58 19.5	12.008
15	11 39 5.88	1.8226	3 2 11.0	13.045	15	13 10 8.23	1.9997	13 10 18.7	11.964
16	11 40 55.29	1.8244	3 15 13.6	13.041	16	13 12 8.37	2.0052	13 22 15.2	11.918
17	11 42 44.81	1.8264	3 28 15.9	13.037	17	13 14 8.85	2.0108	13 34 8.9	11.872
18	11 44 34.46	1.8286	3 41 18.0	13.032	18	13 16 9.67	2.0164	13 45 59.8	11.824
19	11 46 24.24	1.8308	3 54 19.7	13.026	19	13 18 10.82	2.0222	13 57 47.8	11.776
20	11 48 14.15	1.8329	4 7 21.1	13.019	20	13 20 12.33	2.0280	14 9 32.9	11.727
21	11 50 4.19	1.8353	4 20 22.0	13.012	21	13 22 14.18	2.0338	14 21 15.0	11.676
22	11 51 54.38	1.8376	4 33 22.5	13.004	22	13 24 16.39	2.0398	14 32 54.0	11.623
23	11 53 44.70	1.8400	- 4 46 22.5	-12.996	23	13 26 18.95	2.0458	-14 44 29.8	-11.570
JANUARY 14.					JANUARY 16.				
0	11 55 35.18	1.8426	- 4 59 22.0	-12.987	0	13 28 21.88	2.0519	-14 56 2.4	-11.516
1	11 57 25.81	1.8452	5 12 20.9	12.976	1	13 30 25.18	2.0581	15 7 31.7	11.461
2	11 59 16.60	1.8478	5 25 19.1	12.965	2	13 32 28.85	2.0643	15 18 57.7	11.404
3	12 1 7.55	1.8506	5 38 16.7	12.953	3	13 34 32.89	2.0705	15 30 20.2	11.346
4	12 2 58.67	1.8534	5 51 13.5	12.941	4	13 36 37.31	2.0769	15 41 39.2	11.287
5	12 4 49.96	1.8563	6 4 9.6	12.928	5	13 38 42.12	2.0833	15 52 54.6	11.227
6	12 6 41.42	1.8593	6 17 4.9	12.914	6	13 40 47.31	2.0898	16 4 6.4	11.165
7	12 8 33.07	1.8623	6 29 59.3	12.898	7	13 42 52.89	2.0963	16 15 14.4	11.103
8	12 10 24.90	1.8655	6 42 52.7	12.883	8	13 44 58.87	2.1030	16 26 18.7	11.039
9	12 12 16.93	1.8687	6 55 45.3	12.868	9	13 47 5.25	2.1096	16 37 19.1	10.973
10	12 14 9.14	1.8719	7 8 36.8	12.849	10	13 49 12.02	2.1163	16 48 15.5	10.907
11	12 16 1.56	1.8753	7 21 27.2	12.832	11	13 51 19.20	2.1231	16 59 7.9	10.839
12	12 17 54.18	1.8788	7 34 16.6	12.813	12	13 53 26.79	2.1299	17 9 56.2	10.770
13	12 19 47.01	1.8822	7 47 4.8	12.793	13	13 55 34.79	2.1368	17 20 40.3	10.699
14	12 21 40.04	1.8858	7 59 51.8	12.773	14	13 57 43.21	2.1438	17 31 20.1	10.628
15	12 23 33.30	1.8894	8 12 37.5	12.752	15	13 59 52.04	2.1508	17 41 55.6	10.554
16	12 25 26.77	1.8932	8 25 22.0	12.729	16	14 2 1.90	2.1578	17 52 26.6	10.479
17	12 27 20.48	1.8970	8 38 5.0	12.706	17	14 4 10.98	2.1649	18 2 53.1	10.403
18	12 29 14.41	1.9008	8 50 46.7	12.683	18	14 6 21.09	2.1721	18 13 15.0	10.327
19	12 31 8.57	1.9048	9 3 26.9	12.658	19	14 8 31.63	2.1793	18 23 32.3	10.248
20	12 33 2.98	1.9088	9 16 5.6	12.632	20	14 10 42.61	2.1866	18 33 44.7	10.168
21	12 34 57.63	1.9129	9 28 42.7	12.605	21	14 12 54.02	2.1938	18 43 52.4	10.087
22	12 36 52.53	1.9171	9 41 18.2	12.578	22	14 15 5.87	2.2012	18 53 55.1	10.003
23	12 38 47.68	1.9213	9 53 52.0	12.549	23	14 17 18.16	2.2086	19 3 52.8	9.919
24	12 40 43.09	1.9257	-10 6 24.1	-12.520	24	14 19 30.90	2.2160	-19 13 45.4	-9.833

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 17.					JANUARY 19.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	14 19 30.90	2.2160	-19 13 45.4	-9.833	0	16 14 41.34	2.5749	-24 57 45.8	-3.899
1	14 21 44.08	2.2235	19 23 32.8	9.746	1	16 17 16.03	2.5813	25 1 35.0	3.738
2	14 23 57.72	2.2310	19 33 14.9	9.658	2	16 19 51.10	2.5876	25 5 14.4	3.575
3	14 26 11.80	2.2385	19 42 51.7	9.568	3	16 22 26.54	2.5937	25 8 44.0	3.412
4	14 28 26.34	2.2461	19 52 23.0	9.475	4	16 25 2.34	2.5997	25 12 3.8	3.247
5	14 30 41.33	2.2538	20 1 48.7	9.382	5	16 27 38.50	2.6056	25 15 13.6	3.080
6	14 32 56.79	2.2614	20 11 8.8	9.288	6	16 30 15.01	2.6113	25 18 13.4	2.913
7	14 35 12.70	2.2690	20 20 23.2	9.192	7	16 32 51.86	2.6170	25 21 3.1	2.743
8	14 37 29.07	2.2767	20 29 31.8	9.093	8	16 35 29.05	2.6226	25 23 42.6	2.573
9	14 39 45.90	2.2844	20 38 34.4	8.994	9	16 38 6.57	2.6280	25 26 11.9	2.403
10	14 42 3.20	2.2922	20 47 31.1	8.894	10	16 40 44.41	2.6333	25 28 30.9	2.230
11	14 44 20.96	2.2998	20 56 21.7	8.792	11	16 43 22.57	2.6385	25 30 39.5	2.056
12	14 46 39.18	2.3076	21 5 6.1	8.688	12	16 46 1.03	2.6435	25 32 37.6	1.881
13	14 48 57.87	2.3154	21 13 44.2	8.583	13	16 48 39.79	2.6484	25 34 25.2	1.705
14	14 51 17.03	2.3233	21 22 16.0	8.476	14	16 51 18.84	2.6533	25 36 2.2	1.528
15	14 53 36.66	2.3311	21 30 41.3	8.367	15	16 53 58.18	2.6578	25 37 28.6	1.351
16	14 55 56.76	2.3389	21 39 0.0	8.257	16	16 56 37.78	2.6623	25 38 44.3	1.172
17	14 58 17.33	2.3468	21 47 12.1	8.145	17	16 59 17.65	2.6666	25 39 49.2	0.992
18	15 0 38.37	2.3546	21 55 17.4	8.032	18	17 1 57.77	2.6708	25 40 43.3	0.812
19	15 2 59.87	2.3623	22 3 15.9	7.917	19	17 4 38.14	2.6748	25 41 26.6	0.630
20	15 5 21.85	2.3702	22 11 7.4	7.800	20	17 7 18.74	2.6787	25 41 58.9	0.447
21	15 7 44.29	2.3779	22 18 51.9	7.683	21	17 9 59.58	2.6824	25 42 20.2	0.263
22	15 10 7.20	2.3858	22 26 29.3	7.563	22	17 12 40.63	2.6858	25 42 30.5	-0.080
23	15 12 30.58	2.3936	-22 33 59.4	-7.441	23	17 15 21.88	2.6893	-25 42 29.8	+0.105
JANUARY 18.					JANUARY 20.				
0	15 14 54.43	2.4013	-22 41 22.2	-7.318	0	17 18 3.34	2.6926	-25 42 17.9	+0.291
1	15 17 18.74	2.4091	22 48 37.6	7.194	1	17 20 44.99	2.6967	25 41 54.9	0.477
2	15 19 43.52	2.4168	22 55 45.5	7.068	2	17 23 26.82	2.6995	25 41 20.7	0.663
3	15 22 8.76	2.4246	23 2 45.8	6.941	3	17 26 8.81	2.7013	25 40 35.3	0.851
4	15 24 34.47	2.4323	23 9 38.4	6.811	4	17 28 50.97	2.7038	25 39 38.6	1.038
5	15 27 0.63	2.4398	23 16 23.1	6.680	5	17 31 33.27	2.7063	25 38 30.7	1.226
6	15 29 27.25	2.4474	23 23 0.0	6.548	6	17 34 15.72	2.7085	25 37 11.5	1.415
7	15 31 54.32	2.4550	23 29 28.9	6.413	7	17 36 58.29	2.7105	25 35 40.9	1.604
8	15 34 21.85	2.4626	23 35 49.6	6.278	8	17 39 40.98	2.7123	25 33 59.0	1.793
9	15 36 49.83	2.4701	23 42 2.2	6.142	9	17 42 23.77	2.7141	25 32 5.7	1.983
10	15 39 18.26	2.4776	23 48 6.6	6.003	10	17 45 6.67	2.7157	25 30 1.0	2.173
11	15 41 47.14	2.4849	23 54 2.5	5.862	11	17 47 49.65	2.7169	25 27 45.0	2.363
12	15 44 16.45	2.4923	23 59 50.0	5.720	12	17 50 32.70	2.7181	25 25 17.5	2.553
13	15 46 46.21	2.4996	24 5 28.9	5.577	13	17 53 15.82	2.7192	25 22 38.6	2.743
14	15 49 16.40	2.5068	24 10 59.2	5.432	14	17 55 59.00	2.7201	25 19 48.3	2.933
15	15 51 47.02	2.5140	24 16 20.7	5.285	15	17 58 42.23	2.7208	25 16 46.6	3.123
16	15 54 18.08	2.5211	24 21 33.4	5.137	16	18 1 25.49	2.7212	25 13 33.5	3.314
17	15 56 49.55	2.5281	24 26 37.1	4.987	17	18 4 8.77	2.7215	25 10 8.9	3.504
18	15 59 21.45	2.5350	24 31 31.8	4.836	18	18 6 52.07	2.7217	25 6 33.0	3.694
19	16 1 53.75	2.5418	24 36 17.4	4.684	19	18 9 35.37	2.7216	25 2 45.6	3.884
20	16 4 26.47	2.5488	24 40 53.9	4.530	20	18 12 18.66	2.7214	24 58 46.9	4.073
21	16 6 59.60	2.5554	24 45 21.0	4.374	21	18 15 1.94	2.7211	24 54 36.8	4.263
22	16 9 33.12	2.5620	24 49 38.8	4.218	22	18 17 45.19	2.7205	24 50 15.3	4.453
23	16 12 7.04	2.5685	24 53 47.1	4.058	23	18 20 28.40	2.7198	24 45 42.5	4.641
24	16 14 41.34	2.5749	-24 57 45.8	-3.899	24	18 23 11.56	2.7189	-24 40 58.4	+4.829

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 21.					JANUARY 23.				
	h m s		° ' "	"		h m s		° ' "	"
0	18 23 11.56	2.7189	-24 40 58.4	+4.829	0	20 30 2.67	2.5274	-17 30 59.1	+12.530
1	18 25 54.67	2.7178	24 36 3.0	5.017	1	20 32 34.14	2.5218	17 18 23.7	17.649
2	18 28 37.70	2.7166	24 30 56.4	5.204	2	20 35 5.25	2.5157	17 5 41.2	12.766
3	18 31 20.66	2.7153	24 25 38.5	5.392	3	20 37 36.02	2.5098	16 52 51.8	12.880
4	18 34 3.54	2.7138	24 20 9.4	5.578	4	20 40 6.43	2.5039	16 39 55.6	12.993
5	18 36 46.31	2.7120	24 14 29.2	5.763	5	20 42 36.49	2.4981	16 26 52.7	13.103
6	18 39 28.98	2.7102	24 8 37.9	5.947	6	20 45 6.20	2.4923	16 13 43.2	13.212
7	18 42 11.53	2.7082	24 2 35.6	6.131	7	20 47 35.56	2.4863	16 0 27.3	13.318
8	18 44 53.96	2.7060	23 56 22.2	6.314	8	20 50 4.56	2.4804	15 47 5.1	13.422
9	18 47 36.25	2.7037	23 49 57.9	6.496	9	20 52 33.21	2.4746	15 33 36.7	13.524
10	18 50 18.40	2.7013	23 43 22.7	6.678	10	20 55 1.51	2.4688	15 20 2.2	13.624
11	18 53 0.40	2.6987	23 36 36.6	6.858	11	20 57 29.46	2.4628	15 6 21.8	13.722
12	18 55 42.24	2.6960	23 29 39.7	7.038	12	20 59 57.05	2.4569	14 52 35.6	13.818
13	18 58 23.91	2.6929	23 22 32.1	7.216	13	21 2 24.29	2.4511	14 38 43.7	13.911
14	19 1 5.39	2.6899	23 15 13.8	7.394	14	21 4 51.18	2.4453	14 24 46.3	14.002
15	19 3 46.70	2.6868	23 7 44.8	7.570	15	21 7 17.73	2.4395	14 10 43.5	14.091
16	19 6 27.80	2.6834	23 0 5.4	7.745	16	21 9 43.92	2.4337	13 56 35.4	14.178
17	19 9 8.71	2.6800	22 52 15.4	7.919	17	21 12 9.77	2.4279	13 42 22.1	14.263
18	19 11 49.40	2.6764	22 44 15.1	8.091	18	21 14 35.27	2.4222	13 28 3.8	14.345
19	19 14 29.88	2.6728	22 36 4.5	8.263	19	21 17 0.43	2.4164	13 13 40.7	14.426
20	19 17 10.14	2.6690	22 27 43.6	8.433	20	21 19 25.24	2.4107	12 59 12.7	14.504
21	19 19 50.16	2.6651	22 19 12.5	8.602	21	21 21 49.71	2.4051	12 44 40.2	14.580
22	19 22 29.95	2.6611	22 10 31.4	8.769	22	21 24 13.85	2.3994	12 30 3.1	14.654
23	19 25 9.49	2.6568	-22 1 40.2	+8.935	23	21 26 37.64	2.3938	-12 15 21.7	+14.726
JANUARY 22.					JANUARY 24.				
	h m s		° ' "	"		h m s		° ' "	"
0	19 27 48.77	2.6536	-21 52 39.2	+9.099	0	21 29 1.10	2.3883	-12 0 36.0	+14.796
1	19 30 27.80	2.6483	21 43 28.3	9.262	1	21 31 24.23	2.3828	11 45 46.2	14.863
2	19 33 6.56	2.6438	21 34 7.8	9.423	2	21 33 47.03	2.3773	11 30 52.4	14.928
3	19 35 45.05	2.6393	21 24 37.5	9.583	3	21 36 9.50	2.3718	11 15 54.8	14.991
4	19 38 23.27	2.6346	21 14 57.8	9.741	4	21 38 31.65	2.3664	11 0 53.5	15.053
5	19 41 1.20	2.6298	21 5 8.6	9.898	5	21 40 53.47	2.3610	10 45 48.5	15.112
6	19 43 38.85	2.6251	20 55 10.0	10.053	6	21 43 14.97	2.3558	10 30 40.1	15.168
7	19 46 16.21	2.6202	20 45 2.2	10.206	7	21 45 36.16	2.3506	10 15 28.3	15.223
8	19 48 53.27	2.6152	20 34 45.3	10.358	8	21 47 57.03	2.3458	10 0 13.3	15.277
9	19 51 30.03	2.6101	20 24 19.3	10.508	9	21 50 17.59	2.3401	9 44 55.1	15.327
10	19 54 6.48	2.6049	20 13 44.3	10.657	10	21 52 37.84	2.3350	9 29 34.1	15.375
11	19 56 42.62	2.5998	20 3 0.5	10.808	11	21 54 57.79	2.3299	9 14 10.1	15.422
12	19 59 18.45	2.5945	19 52 8.0	10.947	12	21 57 17.43	2.3249	8 58 43.5	15.466
13	20 1 53.96	2.5892	19 41 6.9	11.089	13	21 59 36.78	2.3200	8 43 14.2	15.509
14	20 4 29.15	2.5838	19 29 57.3	11.230	14	22 1 55.83	2.3151	8 27 42.4	15.549
15	20 7 4.01	2.5783	19 18 39.3	11.369	15	22 4 14.59	2.3103	8 12 8.3	15.587
16	20 9 38.54	2.5728	19 7 13.0	11.506	16	22 6 33.07	2.3056	7 56 32.0	15.623
17	20 12 12.74	2.5673	18 55 38.6	11.641	17	22 8 51.26	2.3008	7 40 53.5	15.658
18	20 14 46.61	2.5617	18 43 56.1	11.773	18	22 11 9.17	2.2962	7 25 13.0	15.690
19	20 17 20.14	2.5560	18 32 5.8	11.904	19	22 13 26.80	2.2916	7 9 30.7	15.720
20	20 19 53.33	2.5503	18 20 7.6	12.034	20	22 15 44.16	2.2871	6 53 46.6	15.748
21	20 22 26.18	2.5447	18 8 1.7	12.162	21	22 18 1.25	2.2827	6 38 0.9	15.774
22	20 24 58.69	2.5390	17 55 48.2	12.287	22	22 20 18.08	2.2783	6 22 13.7	15.798
23	20 27 30.85	2.5332	17 43 27.3	12.409	23	22 22 34.64	2.2739	6 6 25.1	15.821
24	20 30 2.67	2.5274	-17 30 59.1	+12.530	24	22 24 50.95	2.2696	-5 50 35.2	+15.842

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 25.					JANUARY 27.				
	h m s		° ' "	"		h m s		° ' "	"
0	22 24 50.95	2.2698	-5 50 35.2	+15.842	0	0 10 15.96	2.1805	+ 6 40 21.6	+14.848
1	22 27 7.01	2.2656	5 34 44.1	15.860	1	0 12 24.97	2.1498	6 55 10.8	14.792
2	22 29 22.82	2.2614	5 18 52.0	15.877	2	0 14 33.93	2.1401	7 9 56.6	14.735
3	22 31 38.38	2.2574	5 2 58.9	15.892	3	0 16 42.86	2.1485	7 24 39.0	14.677
4	22 33 53.71	2.2534	4 47 5.0	15.905	4	0 18 51.75	2.1479	7 39 17.8	14.617
5	22 36 8.79	2.2495	4 31 10.3	15.917	5	0 21 0.61	2.1474	7 53 53.0	14.556
6	22 38 23.65	2.2458	4 15 15.0	15.925	6	0 23 9.44	2.1470	8 8 24.5	14.494
7	22 40 38.28	2.2419	3 59 19.3	15.933	7	0 25 18.25	2.1467	8 22 52.3	14.431
8	22 42 52.68	2.2383	3 43 23.1	15.938	8	0 27 27.04	2.1463	8 37 16.2	14.367
9	22 45 6.87	2.2347	3 27 26.7	15.942	9	0 29 35.81	2.1460	8 51 36.3	14.302
10	22 47 20.84	2.2310	3 11 30.1	15.944	10	0 31 44.56	2.1458	9 5 52.4	14.234
11	22 49 34.59	2.2276	2 55 33.4	15.945	11	0 33 53.31	2.1458	9 20 4.4	14.167
12	22 51 48.15	2.2243	2 39 36.7	15.943	12	0 36 2.05	2.1457	9 34 12.4	14.098
13	22 54 1.50	2.2209	2 23 40.2	15.940	13	0 38 10.79	2.1458	9 48 16.2	14.028
14	22 56 14.66	2.2177	2 7 43.9	15.935	14	0 40 19.54	2.1458	10 2 15.8	13.958
15	22 58 27.62	2.2144	1 51 48.0	15.928	15	0 42 28.28	2.1458	10 16 11.1	13.886
16	23 0 40.39	2.2113	1 35 52.6	15.920	16	0 44 37.04	2.1461	10 30 2.1	13.813
17	23 2 52.98	2.2083	1 19 57.6	15.910	17	0 46 45.81	2.1463	10 43 48.7	13.739
18	23 5 5.39	2.2054	1 4 3.4	15.898	18	0 48 54.59	2.1465	10 57 30.8	13.663
19	23 7 17.63	2.2025	0 48 9.8	15.886	19	0 51 3.39	2.1468	11 11 8.3	13.588
20	23 9 29.69	2.1997	0 32 17.1	15.870	20	0 53 12.21	2.1472	11 24 41.3	13.511
21	23 11 41.59	2.1969	0 16 25.4	15.853	21	0 55 21.05	2.1476	11 38 9.6	13.433
22	23 13 53.32	2.1943	-0 0 34.7	15.836	22	0 57 29.92	2.1481	11 51 33.3	13.354
23	23 16 4.90	2.1917	+0 15 14.9	+15.816	23	0 59 38.82	2.1486	+12 4 52.1	+13.274
JANUARY 26.					JANUARY 28.				
	h m s		° ' "	"		h m s		° ' "	"
0	23 18 16.32	2.1891	+0 31 3.2	+15.794	0	1 1 47.75	2.1492	+12 18 6.2	+13.193
1	23 20 27.59	2.1867	0 46 50.2	15.772	1	1 3 56.72	2.1498	12 31 15.3	13.111
2	23 22 38.72	2.1844	1 2 35.8	15.747	2	1 6 5.72	2.1504	12 44 19.5	13.028
3	23 24 49.72	2.1821	1 18 19.8	15.721	3	1 8 14.77	2.1512	12 57 18.7	12.945
4	23 27 0.57	2.1798	1 34 2.3	15.693	4	1 10 23.86	2.1519	13 10 12.9	12.860
5	23 29 11.29	2.1777	1 49 43.0	15.664	5	1 12 33.00	2.1528	13 23 1.9	12.774
6	23 31 21.89	2.1757	2 5 22.0	15.634	6	1 14 42.19	2.1535	13 35 45.8	12.688
7	23 33 32.37	2.1737	2 20 59.1	15.603	7	1 16 51.42	2.1544	13 48 24.5	12.601
8	23 35 42.73	2.1718	2 36 34.3	15.569	8	1 19 0.72	2.1554	14 0 57.9	12.512
9	23 37 52.98	2.1698	2 52 7.4	15.534	9	1 21 10.07	2.1563	14 13 25.9	12.423
10	23 40 3.11	2.1680	3 7 38.4	15.498	10	1 23 19.48	2.1573	14 25 48.6	12.333
11	23 42 13.14	2.1663	3 23 7.1	15.459	11	1 25 28.94	2.1583	14 38 5.9	12.243
12	23 44 23.07	2.1648	3 38 33.5	15.421	12	1 27 38.48	2.1595	14 50 17.7	12.150
13	23 46 32.91	2.1632	3 53 57.6	15.380	13	1 29 48.08	2.1606	15 2 23.9	12.058
14	23 48 42.65	2.1617	4 9 19.1	15.338	14	1 31 57.75	2.1617	15 14 24.6	11.964
15	23 50 52.31	2.1603	4 24 38.2	15.296	15	1 34 7.48	2.1628	15 26 19.6	11.870
16	23 53 1.88	2.1588	4 39 54.6	15.251	16	1 36 17.29	2.1642	15 38 9.0	11.775
17	23 55 11.37	2.1576	4 55 8.3	15.205	17	1 38 27.18	2.1653	15 49 52.6	11.679
18	23 57 20.79	2.1564	5 10 19.2	15.158	18	1 40 37.13	2.1666	16 1 30.5	11.583
19	23 59 30.14	2.1553	5 25 27.2	15.109	19	1 42 47.17	2.1680	16 13 2.5	11.484
20	0 1 39.42	2.1542	5 40 32.3	15.059	20	1 44 57.29	2.1693	16 24 28.6	11.386
21	0 3 48.64	2.1532	5 55 34.3	15.008	21	1 47 7.48	2.1706	16 35 48.8	11.286
22	0 5 57.80	2.1523	6 10 33.3	14.967	22	1 49 17.76	2.1720	16 47 3.1	11.188
23	0 8 6.91	2.1513	6 25 29.1	14.903	23	1 51 28.12	2.1733	16 58 11.3	11.087
24	0 10 15.96	2.1505	+6 40 21.6	+14.848	24	1 53 38.56	2.1748	+17 9 13.5	+10.986

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 29.					JANUARY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	1 53 38.56	2.1748	+17 9 13.5	+10.986	0	3 39 48.31	2.2450	+23 47 43.0	+5.415
1	1 55 49.09	2.1763	17 20 9.6	10.883	1	3 42 3.04	2.2460	23 53 4.1	5.288
2	1 57 59.71	2.1778	17 30 59.5	10.781	2	3 44 17.83	2.2469	23 58 17.6	5.161
3	2 0 10.42	2.1793	17 41 43.3	10.678	3	3 46 32.67	2.2478	24 3 23.4	5.033
4	2 2 21.22	2.1808	17 52 20.8	10.573	4	3 48 47.57	2.2487	24 8 21.6	4.906
5	2 4 32.11	2.1823	18 2 52.1	10.468	5	3 51 2.51	2.2495	24 13 12.1	4.778
6	2 6 43.10	2.1838	18 13 17.0	10.363	6	3 53 17.51	2.2503	24 17 54.9	4.649
7	2 8 54.17	2.1853	18 23 35.6	10.257	7	3 55 32.54	2.2509	24 22 30.0	4.521
8	2 11 5.34	2.1869	18 33 47.8	10.150	8	3 57 47.62	2.2516	24 26 57.4	4.392
9	2 13 16.60	2.1885	18 43 53.6	10.042	9	4 0 2.73	2.2522	24 31 17.0	4.263
10	2 15 27.96	2.1901	18 53 52.8	9.933	10	4 2 17.88	2.2528	24 35 29.0	4.134
11	2 17 39.41	2.1916	19 3 45.6	9.825	11	4 4 33.06	2.2533	24 39 33.1	4.005
12	2 19 50.95	2.1933	19 13 31.8	9.715	12	4 6 48.27	2.2538	24 43 29.6	3.877
13	2 22 2.60	2.1949	19 23 11.4	9.605	13	4 9 3.51	2.2542	24 47 18.3	3.746
14	2 24 14.34	2.1965	19 32 44.4	9.494	14	4 11 18.77	2.2545	24 50 59.1	3.616
15	2 26 26.18	2.1982	19 42 10.7	9.383	15	4 13 34.05	2.2548	24 54 32.2	3.487
16	2 28 38.12	2.1998	19 51 30.3	9.271	16	4 15 49.35	2.2551	24 57 57.5	3.357
17	2 30 50.15	2.2013	20 0 43.2	9.158	17	4 18 4.66	2.2553	25 1 15.0	3.227
18	2 33 2.28	2.2030	20 9 49.3	9.044	18	4 20 19.99	2.2555	25 4 24.7	3.097
19	2 35 14.51	2.2046	20 18 48.5	8.930	19	4 22 35.32	2.2556	25 7 26.6	2.966
20	2 37 26.83	2.2063	20 27 40.9	8.817	20	4 24 50.66	2.2557	25 10 20.6	2.836
21	2 39 39.26	2.2078	20 36 26.5	8.702	21	4 27 6.00	2.2556	25 13 6.9	2.706
22	2 41 51.77	2.2094	20 45 5.1	8.585	22	4 29 21.33	2.2555	25 15 45.3	2.576
23	2 44 4.39	2.2110	+20 53 36.7	+8.468	23	4 31 36.66	2.2554	+25 18 16.0	+2.446
JANUARY 30.					FEBRUARY 1.				
0	2 46 17.09	2.2126	+21 2 1.3	+8.353	0	4 33 51.98	2.2553	+25 20 38.8	+2.315
1	2 48 29.90	2.2143	21 10 19.0	8.236	1	4 36 7.29	2.2550	25 22 53.8	2.184
2	2 50 42.80	2.2158	21 18 29.6	8.118	2	4 38 22.58	2.2547	25 25 0.9	2.054
3	2 52 55.79	2.2173	21 26 33.1	7.999	3	4 40 37.85	2.2543	25 27 0.3	1.924
4	2 55 8.87	2.2188	21 34 29.5	7.881	4	4 42 53.10	2.2539	25 28 51.8	1.793
5	2 57 22.05	2.2204	21 42 18.8	7.762	5	4 45 8.32	2.2533	25 30 35.5	1.663
6	2 59 35.32	2.2219	21 50 0.9	7.642	6	4 47 23.51	2.2528	25 32 11.4	1.533
7	3 1 48.68	2.2234	21 57 35.8	7.522	7	4 49 38.66	2.2523	25 33 39.4	1.403
8	3 4 2.13	2.2249	22 5 3.5	7.401	8	4 51 53.78	2.2517	25 34 59.7	1.273
9	3 6 15.67	2.2263	22 12 23.9	7.280	9	4 54 8.86	2.2509	25 36 12.2	1.143
10	3 8 29.29	2.2278	22 19 37.1	7.158	10	4 56 23.89	2.2501	25 37 16.8	1.013
11	3 10 43.00	2.2293	22 26 42.9	7.036	11	4 58 38.87	2.2493	25 38 13.7	0.883
12	3 12 56.80	2.2307	22 33 41.4	6.914	12	5 0 53.80	2.2483	25 39 2.8	0.753
13	3 15 10.68	2.2320	22 40 32.6	6.791	13	5 3 8.67	2.2474	25 39 44.1	0.624
14	3 17 24.64	2.2333	22 47 16.3	6.668	14	5 5 23.49	2.2464	25 40 17.7	0.496
15	3 19 38.68	2.2347	22 53 52.7	6.544	15	5 7 38.24	2.2453	25 40 43.6	0.367
16	3 21 52.80	2.2359	23 0 21.6	6.420	16	5 9 52.92	2.2441	25 41 1.7	0.237
17	3 24 6.99	2.2372	23 6 43.1	6.296	17	5 12 7.53	2.2429	25 41 12.0	+0.108
18	3 26 21.26	2.2384	23 12 57.1	6.172	18	5 14 22.07	2.2417	25 41 14.7	-0.020
19	3 28 35.60	2.2396	23 19 3.7	6.046	19	5 16 36.53	2.2403	25 41 9.6	0.148
20	3 30 50.01	2.2407	23 25 2.6	5.920	20	5 18 50.90	2.2388	25 40 56.9	0.276
21	3 33 4.48	2.2418	23 30 54.1	5.795	21	5 21 5.19	2.2374	25 40 36.5	0.401
22	3 35 19.03	2.2430	23 36 38.0	5.668	22	5 23 19.39	2.2359	25 40 8.4	0.532
23	3 37 33.64	2.2440	23 42 14.3	5.542	23	5 25 33.50	2.2343	25 39 32.7	0.658
24	3 39 48.31	2.2450	+23 47 43.0	+5.415	24	5 27 47.51	2.2327	+25 38 49.4	-0.785

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 2.					FEBRUARY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 27 47.51	2.2327	+25 38 49.4	-0.785	0	7 12 5.43	2.0972	+22 42 57.3	-6.334
1	5 30 1.42	2.2310	25 37 58.5	0.913	1	7 14 11.15	2.0934	22 36 34.2	6.436
2	5 32 15.23	2.2293	25 36 59.9	1.039	2	7 16 16.64	2.0898	22 30 5.0	6.536
3	5 34 28.93	2.2274	25 35 53.8	1.164	3	7 18 21.92	2.0862	22 23 29.9	6.635
4	5 36 42.52	2.2256	25 34 40.2	1.290	4	7 20 26.98	2.0824	22 16 48.8	6.733
5	5 38 56.00	2.2237	25 33 19.0	1.416	5	7 22 31.81	2.0788	22 10 1.9	6.831
6	5 41 9.36	2.2217	25 31 50.3	1.541	6	7 24 36.43	2.0751	22 3 9.1	6.929
7	5 43 22.60	2.2196	25 30 14.1	1.665	7	7 26 40.82	2.0713	21 56 10.4	7.025
8	5 45 35.71	2.2175	25 28 30.5	1.789	8	7 28 44.98	2.0676	21 49 6.1	7.121
9	5 47 48.70	2.2154	25 26 39.4	1.913	9	7 30 48.93	2.0639	21 41 55.9	7.216
10	5 50 1.56	2.2132	25 24 40.9	2.037	10	7 32 52.65	2.0601	21 34 40.2	7.310
11	5 52 14.28	2.2108	25 22 35.0	2.159	11	7 34 56.14	2.0563	21 27 18.7	7.404
12	5 54 26.86	2.2085	25 20 21.8	2.282	12	7 36 59.41	2.0527	21 19 51.7	7.496
13	5 56 39.30	2.2062	25 18 1.2	2.404	13	7 39 2.46	2.0489	21 12 19.2	7.588
14	5 58 51.60	2.2038	25 15 33.3	2.525	14	7 41 5.28	2.0451	21 4 41.1	7.679
15	6 1 3.76	2.2013	25 12 58.2	2.647	15	7 43 7.87	2.0413	20 56 57.7	7.769
16	6 3 15.76	2.1988	25 10 15.7	2.768	16	7 45 10.24	2.0376	20 49 8.8	7.860
17	6 5 27.61	2.1963	25 7 26.0	2.888	17	7 47 12.38	2.0338	20 41 14.5	7.948
18	6 7 39.31	2.1937	25 4 29.2	3.008	18	7 49 14.30	2.0302	20 33 15.0	8.036
19	6 9 50.85	2.1909	25 1 25.1	3.128	19	7 51 16.00	2.0264	20 25 10.2	8.124
20	6 12 2.22	2.1882	24 58 13.9	3.246	20	7 53 17.47	2.0227	20 17 0.1	8.211
21	6 14 13.43	2.1855	24 54 55.6	3.364	21	7 55 18.72	2.0189	20 8 44.9	8.296
22	6 16 24.48	2.1827	24 51 30.2	3.482	22	7 57 19.74	2.0152	20 0 24.6	8.381
23	6 18 35.35	2.1798	+24 47 57.8	-3.599	23	7 59 20.54	2.0115	+19 51 59.2	-8.465
FEBRUARY 3.					FEBRUARY 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 20 46.06	2.1770	+24 44 18.3	-3.716	0	8 1 21.12	2.0078	+19 43 28.8	-8.548
1	6 22 56.59	2.1740	24 40 31.9	3.833	1	8 3 21.47	2.0041	19 34 53.4	8.632
2	6 25 6.94	2.1710	24 36 38.4	3.948	2	8 5 21.61	2.0004	19 26 13.0	8.713
3	6 27 17.11	2.1680	24 32 38.1	4.063	3	8 7 21.52	1.9967	19 17 27.8	8.794
4	6 29 27.10	2.1650	24 28 30.9	4.178	4	8 9 21.21	1.9930	19 8 37.7	8.875
5	6 31 36.91	2.1618	24 24 16.8	4.292	5	8 11 20.68	1.9893	18 59 42.8	8.954
6	6 33 46.52	2.1587	24 19 55.9	4.404	6	8 13 19.93	1.9858	18 50 43.2	9.033
7	6 35 55.95	2.1556	24 15 28.3	4.517	7	8 15 18.97	1.9821	18 41 38.9	9.111
8	6 38 5.19	2.1523	24 10 53.9	4.629	8	8 17 17.78	1.9785	18 32 29.9	9.188
9	6 40 14.23	2.1490	24 6 12.8	4.741	9	8 19 16.39	1.9749	18 23 16.3	9.264
10	6 42 23.07	2.1458	24 1 25.0	4.853	10	8 21 14.77	1.9713	18 13 58.2	9.340
11	6 44 31.72	2.1425	23 56 30.5	4.963	11	8 23 12.95	1.9678	18 4 35.5	9.415
12	6 46 40.17	2.1392	23 51 29.5	5.072	12	8 25 10.91	1.9643	17 55 8.4	9.488
13	6 48 48.42	2.1358	23 46 21.9	5.180	13	8 27 8.66	1.9608	17 45 36.9	9.562
14	6 50 56.47	2.1324	23 41 7.9	5.288	14	8 29 6.20	1.9573	17 36 1.0	9.634
15	6 53 4.31	2.1289	23 35 47.3	5.397	15	8 31 3.53	1.9538	17 26 20.8	9.706
16	6 55 11.94	2.1255	23 30 20.3	5.503	16	8 33 0.65	1.9503	17 16 36.3	9.777
17	6 57 19.37	2.1221	23 24 46.9	5.610	17	8 34 57.57	1.9469	17 6 47.6	9.847
18	6 59 26.59	2.1186	23 19 7.1	5.716	18	8 36 54.28	1.9435	16 56 54.7	9.916
19	7 1 33.60	2.1150	23 13 21.0	5.820	19	8 38 50.79	1.9402	16 46 57.7	9.985
20	7 3 40.39	2.1114	23 7 28.7	5.924	20	8 40 47.10	1.9368	16 36 56.5	10.053
21	7 5 46.97	2.1079	23 1 30.1	6.028	21	8 42 43.21	1.9335	16 26 51.4	10.119
22	7 7 53.34	2.1043	22 55 25.3	6.132	22	8 44 39.12	1.9303	16 16 42.2	10.186
23	7 9 59.49	2.1008	22 49 14.3	6.233	23	8 46 34.84	1.9270	16 6 29.1	10.251
24	7 12 5.43	2.0972	+22 42 57.3	-6.334	24	8 48 30.36	1.9238	+15 56 12.1	-10.315

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 6.					FEBRUARY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 48 30.36	1.9238	+15 56 12.1	-10.315	0	10 17 50.13	1.8182	+6 41 26.2	-12.508
1	8 50 25.69	1.9206	15 45 51.3	10.379	1	10 19 39.01	1.8141	6 28 54.9	12.534
2	8 52 20.83	1.9174	15 35 26.6	10.443	2	10 21 27.82	1.8130	6 16 22.1	12.561
3	8 54 15.78	1.9143	15 24 58.2	10.504	3	10 23 16.57	1.8121	6 3 47.6	12.588
4	8 56 10.54	1.9111	15 14 26.1	10.565	4	10 25 5.27	1.8112	5 51 11.6	12.612
5	8 58 5.11	1.9081	15 3 50.4	10.626	5	10 26 53.91	1.8102	5 38 34.2	12.636
6	8 59 59.51	1.9051	14 53 11.0	10.687	6	10 28 42.49	1.8093	5 25 55.3	12.660
7	9 1 53.72	1.9020	14 42 28.0	10.746	7	10 30 31.03	1.8087	5 13 15.0	12.683
8	9 3 47.75	1.8991	14 31 41.5	10.803	8	10 32 19.53	1.8079	5 0 33.4	12.705
9	9 5 41.61	1.8962	14 20 51.6	10.861	9	10 34 7.98	1.8073	4 47 50.4	12.727
10	9 7 35.29	1.8932	14 9 58.2	10.918	10	10 35 56.40	1.8067	4 35 6.2	12.747
11	9 9 28.79	1.8903	13 59 1.4	10.974	11	10 37 44.78	1.8061	4 22 20.8	12.767
12	9 11 22.13	1.8876	13 48 1.3	11.029	12	10 39 33.13	1.8056	4 9 34.2	12.786
13	9 13 15.30	1.8848	13 36 57.9	11.083	13	10 41 21.45	1.8052	3 56 46.5	12.804
14	9 15 8.30	1.8820	13 25 51.3	11.137	14	10 43 9.75	1.8048	3 43 57.7	12.823
15	9 17 1.14	1.8793	13 14 41.5	11.189	15	10 44 58.03	1.8044	3 31 7.8	12.839
16	9 18 53.81	1.8766	13 3 28.6	11.242	16	10 46 46.28	1.8042	3 18 17.0	12.855
17	9 20 46.33	1.8740	12 52 12.5	11.293	17	10 48 34.53	1.8040	3 5 25.2	12.871
18	9 22 38.69	1.8714	12 40 53.4	11.343	18	10 50 22.76	1.8038	2 52 32.5	12.886
19	9 24 30.90	1.8689	12 29 31.3	11.393	19	10 52 10.99	1.8036	2 39 38.9	12.900
20	9 26 22.96	1.8664	12 18 6.2	11.443	20	10 53 59.22	1.8038	2 26 44.5	12.913
21	9 28 14.87	1.8639	12 6 38.2	11.491	21	10 55 47.44	1.8038	2 13 49.4	12.925
22	9 30 6.63	1.8615	11 55 7.3	11.538	22	10 57 35.67	1.8039	2 0 53.5	12.938
23	9 31 58.25	1.8592	+11 43 33.7	-11.584	23	10 59 23.91	1.8041	+1 47 56.9	-12.949
FEBRUARY 7.					FEBRUARY 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 33 49.73	1.8568	+11 31 57.2	-11.631	0	11 1 12.16	1.8043	+1 34 59.6	-12.959
1	9 35 41.07	1.8545	11 20 18.0	11.676	1	11 3 0.42	1.8045	1 22 1.8	12.969
2	9 37 32.27	1.8523	11 8 36.1	11.720	2	11 4 48.70	1.8049	1 9 3.3	12.978
3	9 39 23.34	1.8501	10 56 51.6	11.763	3	11 6 37.01	1.8053	0 56 4.4	12.986
4	9 41 14.28	1.8479	10 45 4.5	11.807	4	11 8 25.34	1.8057	0 43 5.0	12.993
5	9 43 5.09	1.8456	10 33 14.8	11.848	5	11 10 13.69	1.8062	0 30 5.2	13.001
6	9 44 55.78	1.8438	10 21 22.7	11.890	6	11 12 2.08	1.8066	0 17 4.9	13.007
7	9 46 46.34	1.8418	10 9 28.0	11.931	7	11 13 50.51	1.8074	+0 4 4.4	13.012
8	9 48 36.79	1.8396	9 57 31.0	11.970	8	11 15 38.97	1.8081	-0 8 56.5	13.017
9	9 50 27.12	1.8379	9 45 31.6	12.010	9	11 17 27.48	1.8089	0 21 57.6	13.020
10	9 52 17.34	1.8360	9 33 29.8	12.048	10	11 19 16.04	1.8097	0 34 58.9	13.023
11	9 54 7.44	1.8342	9 21 25.8	12.086	11	11 21 4.64	1.8105	0 48 0.3	13.025
12	9 55 57.44	1.8326	9 9 19.5	12.123	12	11 22 53.30	1.8115	1 1 1.9	13.027
13	9 57 47.34	1.8308	8 57 11.0	12.159	13	11 24 42.02	1.8125	1 14 3.5	13.028
14	9 59 37.13	1.8290	8 45 0.4	12.194	14	11 26 30.80	1.8136	1 27 5.2	13.028
15	10 1 26.82	1.8274	8 32 47.7	12.228	15	11 28 19.65	1.8147	1 40 6.9	13.028
16	10 3 16.42	1.8259	8 20 33.0	12.263	16	11 30 8.56	1.8158	1 53 8.5	13.026
17	10 5 5.93	1.8244	8 8 16.2	12.296	17	11 31 57.55	1.8172	2 6 10.0	13.023
18	10 6 55.35	1.8229	7 55 57.5	12.328	18	11 33 46.62	1.8185	2 19 11.3	13.020
19	10 8 44.68	1.8214	7 43 36.8	12.361	19	11 35 35.77	1.8198	2 32 12.4	13.017
20	10 10 33.92	1.8201	7 31 14.2	12.391	20	11 37 25.00	1.8213	2 45 13.3	13.013
21	10 12 23.09	1.8188	7 18 49.9	12.421	21	11 39 14.32	1.8228	2 58 14.0	13.008
22	10 14 12.18	1.8175	7 6 23.7	12.451	22	11 41 3.73	1.8243	3 11 14.2	13.001
23	10 16 1.19	1.8163	6 53 55.8	12.479	23	11 42 53.24	1.8261	3 24 14.1	12.994
24	10 17 50.13	1.8152	+ 6 41 26.2	-12.508	24	11 44 42.86	1.8278	-3 37 13.5	-12.987

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 10.					FEBRUARY 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 44 42.86	1.8278	- 3 37 13.5	-12.987	0	13 15 38.19	1.9856	-13 36 26.1	-11.645
1	11 46 32.58	1.8295	3 50 12.5	12.978	1	13 17 37.47	1.9905	13 48 3.3	11.594
2	11 48 22.40	1.8313	4 3 10.9	12.969	2	13 19 37.05	1.9954	13 59 37.4	11.543
3	11 50 12.33	1.8332	4 16 8.8	12.960	3	13 21 36.92	2.0004	14 11 8.5	11.491
4	11 52 2.38	1.8352	4 29 6.1	12.949	4	13 23 37.10	2.0054	14 22 36.3	11.437
5	11 53 52.55	1.8373	4 42 2.7	12.938	5	13 25 37.57	2.0105	14 34 0.9	11.383
6	11 55 42.85	1.8393	4 54 58.6	12.926	6	13 27 38.36	2.0157	14 45 22.2	11.327
7	11 57 33.26	1.8413	5 7 53.8	12.913	7	13 29 39.45	2.0208	14 56 40.1	11.270
8	11 59 23.81	1.8437	5 20 48.1	12.898	8	13 31 40.86	2.0262	15 7 54.6	11.212
9	12 1 14.50	1.8459	5 33 41.6	12.884	9	13 33 42.59	2.0315	15 19 5.5	11.153
10	12 3 5.32	1.8483	5 46 34.2	12.869	10	13 35 44.64	2.0368	15 30 13.0	11.093
11	12 4 56.29	1.8507	5 59 25.9	12.853	11	13 37 47.01	2.0423	15 41 16.7	11.032
12	12 6 47.40	1.8531	6 12 16.5	12.835	12	13 39 49.71	2.0478	15 52 16.8	10.970
13	12 8 38.66	1.8557	6 25 6.1	12.818	13	13 41 52.74	2.0533	16 3 13.1	10.907
14	12 10 30.08	1.8583	6 37 54.6	12.799	14	13 43 56.11	2.0589	16 14 5.6	10.843
15	12 12 21.66	1.8610	6 50 42.0	12.780	15	13 45 59.81	2.0645	16 24 54.2	10.778
16	12 14 13.40	1.8637	7 3 28.2	12.759	16	13 48 3.85	2.0703	16 35 38.9	10.711
17	12 16 5.30	1.8664	7 16 13.1	12.738	17	13 50 8.24	2.0760	16 46 19.5	10.643
18	12 17 57.37	1.8693	7 28 56.8	12.717	18	13 52 12.97	2.0818	16 56 56.0	10.574
19	12 19 49.62	1.8723	7 41 39.1	12.693	19	13 54 18.06	2.0878	17 7 28.4	10.504
20	12 21 42.05	1.8753	7 54 20.0	12.670	20	13 56 23.50	2.0936	17 17 56.5	10.433
21	12 23 34.66	1.8783	8 6 59.5	12.645	21	13 58 29.29	2.0995	17 28 20.3	10.361
22	12 25 27.45	1.8815	8 19 37.4	12.620	22	14 0 35.44	2.1055	17 38 39.8	10.288
23	12 27 20.44	1.8848	- 8 32 13.9	-12.594	23	14 2 41.95	2.1115	-17 48 54.8	-10.212
FEBRUARY 11.					FEBRUARY 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 29 13.62	1.8890	- 8 44 48.7	-12.567	0	14 4 48.82	2.1176	-17 59 5.2	-10.136
1	12 31 7.00	1.8913	8 57 21.9	12.539	1	14 6 56.06	2.1238	18 9 11.1	10.059
2	12 33 0.58	1.8947	9 9 53.4	12.510	2	14 9 3.67	2.1299	18 19 12.3	9.981
3	12 34 54.36	1.8982	9 22 23.1	12.480	3	14 11 11.65	2.1361	18 29 8.8	9.902
4	12 36 48.36	1.9017	9 34 51.0	12.450	4	14 13 20.00	2.1423	18 39 0.5	9.821
5	12 38 42.56	1.9053	9 47 17.1	12.418	5	14 15 28.73	2.1486	18 48 47.3	9.738
6	12 40 36.99	1.9089	9 59 41.2	12.386	6	14 17 37.83	2.1549	18 58 29.1	9.655
7	12 42 31.63	1.9126	10 12 3.4	12.353	7	14 19 47.32	2.1613	19 8 5.9	9.572
8	12 44 26.50	1.9164	10 24 23.6	12.319	8	14 21 57.19	2.1677	19 17 37.7	9.486
9	12 46 21.60	1.9203	10 36 41.7	12.283	9	14 24 7.44	2.1741	19 27 4.2	9.398
10	12 48 16.93	1.9242	10 48 57.6	12.248	10	14 26 18.08	2.1806	19 36 25.5	9.311
11	12 50 12.50	1.9282	11 1 11.4	12.212	11	14 28 29.11	2.1870	19 45 41.5	9.222
12	12 52 8.31	1.9322	11 13 23.0	12.174	12	14 30 40.52	2.1935	19 54 52.1	9.131
13	12 54 4.36	1.9363	11 25 32.3	12.134	13	14 32 52.33	2.2001	20 3 57.2	9.038
14	12 56 0.67	1.9405	11 37 39.1	12.094	14	14 35 4.53	2.2066	20 12 56.7	8.945
15	12 57 57.22	1.9447	11 49 43.6	12.054	15	14 37 17.12	2.2133	20 21 50.6	8.851
16	12 59 54.03	1.9491	12 1 45.6	12.013	16	14 39 30.12	2.2199	20 30 38.8	8.755
17	13 1 51.11	1.9534	12 13 45.1	11.971	17	14 41 43.51	2.2264	20 39 21.2	8.658
18	13 3 48.44	1.9578	12 25 42.1	11.928	18	14 43 57.29	2.2331	20 47 57.8	8.560
19	13 5 46.04	1.9623	12 37 36.4	11.882	19	14 46 11.48	2.2398	20 56 28.4	8.459
20	13 7 43.92	1.9668	12 49 27.9	11.837	20	14 48 26.07	2.2465	21 4 52.9	8.358
21	13 9 42.06	1.9714	13 1 16.8	11.791	21	14 50 41.06	2.2532	21 13 11.4	8.257
22	13 11 40.49	1.9762	13 13 2.8	11.743	22	14 52 56.45	2.2599	21 21 23.7	8.153
23	13 13 39.20	1.9808	13 24 45.9	11.694	23	14 55 12.25	2.2667	21 29 29.7	8.048
24	13 15 38.19	1.9856	-13 36 26.1	-11.645	24	14 57 28.45	2.2733	-21 37 29.4	-7.942

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 14.					FEBRUARY 16.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	14 57 28.45	2.2733	-21 37 29.4	-7.942	0	16 53 56.38	2.5597	-25 31 22.7	-1.331
1	14 59 45.05	2.2801	21 45 22.7	7.834	1	16 56 30.09	2.5638	25 32 37.6	1.166
2	15 2 2.06	2.2868	21 53 9.5	7.725	2	16 59 4.04	2.5679	25 33 42.6	1.000
3	15 4 19.47	2.2935	22 0 49.7	7.614	3	17 1 38.24	2.5718	25 34 37.6	0.833
4	15 6 37.28	2.3003	22 8 23.2	7.503	4	17 4 12.66	2.5757	25 35 22.6	0.665
5	15 8 55.50	2.3070	22 15 50.0	7.390	5	17 6 47.32	2.5795	25 35 57.4	0.497
6	15 11 14.12	2.3137	22 23 10.0	7.276	6	17 9 22.20	2.5831	25 36 22.2	0.328
7	15 13 33.14	2.3203	22 30 23.1	7.160	7	17 11 57.29	2.5865	25 36 36.7	-0.157
8	15 15 52.56	2.3271	22 37 29.2	7.043	8	17 14 32.58	2.5899	25 36 41.0	+0.013
9	15 18 12.39	2.3338	22 44 28.3	6.925	9	17 17 8.08	2.5932	25 36 35.1	0.184
10	15 20 32.62	2.3405	22 51 20.2	6.805	10	17 19 43.76	2.5963	25 36 18.9	0.357
11	15 22 53.25	2.3472	22 58 4.9	6.684	11	17 22 19.63	2.5993	25 35 52.3	0.530
12	15 25 14.28	2.3538	23 4 42.3	6.562	12	17 24 55.68	2.6023	25 35 15.3	0.703
13	15 27 35.71	2.3605	23 11 12.3	6.438	13	17 27 31.90	2.6049	25 34 27.9	0.876
14	15 29 57.54	2.3671	23 17 34.9	6.314	14	17 30 8.27	2.6075	25 33 30.2	1.050
15	15 32 19.76	2.3737	23 23 50.0	6.188	15	17 32 44.80	2.6100	25 32 21.9	1.226
16	15 34 42.38	2.3802	23 29 57.4	6.069	16	17 35 21.47	2.6123	25 31 3.1	1.400
17	15 37 5.38	2.3867	23 35 57.1	5.950	17	17 37 58.28	2.6146	25 29 33.9	1.575
18	15 39 28.78	2.3933	23 41 49.0	5.801	18	17 40 35.22	2.6166	25 27 54.1	1.752
19	15 41 52.57	2.3997	23 47 33.2	5.669	19	17 43 12.27	2.6185	25 26 3.7	1.928
20	15 44 16.74	2.4061	23 53 9.3	5.536	20	17 45 49.44	2.6203	25 24 2.8	2.104
21	15 46 41.30	2.4124	23 58 37.5	5.403	21	17 48 26.71	2.6221	25 21 51.2	2.281
22	15 49 6.23	2.4188	24 3 57.6	5.268	22	17 51 4.09	2.6236	25 19 29.1	2.457
23	15 51 31.55	2.4251	-24 9 9.6	-5.130	23	17 53 41.54	2.6249	-25 16 56.4	+2.634
FEBRUARY 15.					FEBRUARY 17.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	15 53 57.24	2.4313	-24 14 13.2	-4.992	0	17 56 19.08	2.6263	-25 14 13.0	+2.812
1	15 56 23.30	2.4375	24 19 8.6	4.853	1	17 58 56.69	2.6274	25 11 19.0	2.989
2	15 58 49.74	2.4437	24 23 55.6	4.713	2	18 1 34.37	2.6283	25 8 14.3	3.166
3	16 1 16.54	2.4497	24 28 34.1	4.570	3	18 4 12.09	2.6292	25 4 58.9	3.345
4	16 3 43.70	2.4557	24 33 4.0	4.428	4	18 6 49.87	2.6300	25 1 32.9	3.522
5	16 6 11.22	2.4616	24 37 25.4	4.284	5	18 9 27.69	2.6305	24 57 56.3	3.699
6	16 8 39.09	2.4675	24 41 38.1	4.138	6	18 12 5.53	2.6309	24 54 9.0	3.878
7	16 11 7.32	2.4734	24 45 42.0	3.992	7	18 14 43.40	2.6313	24 50 11.0	4.055
8	16 13 35.90	2.4791	24 49 37.1	3.844	8	18 17 21.29	2.6315	24 46 2.4	4.232
9	16 16 4.81	2.4848	24 53 23.3	3.695	9	18 19 59.18	2.6315	24 41 43.2	4.409
10	16 18 34.07	2.4904	24 57 0.5	3.545	10	18 22 37.07	2.6314	24 37 13.3	4.586
11	16 21 3.66	2.4959	25 0 28.7	3.393	11	18 25 14.95	2.6313	24 32 32.9	4.763
12	16 23 33.58	2.5014	25 3 47.7	3.241	12	18 27 52.82	2.6309	24 27 41.8	4.939
13	16 26 3.83	2.5068	25 6 57.6	3.088	13	18 30 30.66	2.6304	24 22 40.2	5.115
14	16 28 34.39	2.5120	25 9 58.3	2.933	14	18 33 8.47	2.6298	24 17 28.0	5.292
15	16 31 5.27	2.5172	25 12 49.6	2.778	15	18 35 46.23	2.6290	24 12 5.2	5.467
16	16 33 36.45	2.5223	25 15 31.6	2.622	16	18 38 23.95	2.6283	24 6 32.0	5.641
17	16 36 7.95	2.5273	25 18 4.2	2.463	17	18 41 1.62	2.6273	24 0 48.3	5.816
18	16 38 39.73	2.5322	25 20 27.2	2.304	18	18 43 39.22	2.6260	23 54 54.1	5.989
19	16 41 11.81	2.5371	25 22 40.7	2.145	19	18 46 16.74	2.6248	23 48 49.6	6.163
20	16 43 44.18	2.5418	25 24 44.6	1.984	20	18 48 54.20	2.6235	23 42 34.6	6.336
21	16 46 16.82	2.5463	25 26 38.8	1.823	21	18 51 31.56	2.6220	23 36 9.3	6.508
22	16 48 49.74	2.5509	25 28 23.3	1.669	22	18 54 8.84	2.6204	23 29 33.7	6.678
23	16 51 22.93	2.5553	25 29 57.9	1.495	23	18 56 46.01	2.6187	23 22 47.9	6.849
24	16 53 56.38	2.5597	-25 31 22.7	-1.331	24	18 59 23.08	2.6168	-23 15 51.8	+7.020

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 18.					FEBRUARY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 59 23.08	2.6168	-23 15 51.8	+ 7.020	0	21 1 17.05	2.4419	-14 44 39.5	+13.713
1	19 2 0.03	2.6149	23 8 45.5	7.189	1	21 3 43.43	2.4375	14 30 53.8	13.811
2	19 4 36.87	2.6129	23 1 20.1	7.358	2	21 6 9.55	2.4333	14 17 2.2	13.908
3	19 7 13.58	2.6107	22 54 2.6	7.525	3	21 8 35.41	2.4288	14 3 4.9	14.002
4	19 9 50.15	2.6084	22 46 28.1	7.692	4	21 11 1.00	2.4243	13 49 2.0	14.095
5	19 12 26.59	2.6061	22 38 39.6	7.858	5	21 13 26.33	2.4200	13 34 53.5	14.186
6	19 15 2.88	2.6036	22 30 43.2	8.023	6	21 15 51.40	2.4156	13 20 39.7	14.274
7	19 17 39.02	2.6011	22 22 36.9	8.187	7	21 18 16.20	2.4113	13 6 20.6	14.362
8	19 20 15.01	2.5984	22 14 20.8	8.350	8	21 20 40.75	2.4070	12 51 56.3	14.446
9	19 22 50.83	2.5956	22 5 54.9	8.513	9	21 23 5.04	2.4027	12 37 27.1	14.528
10	19 25 26.48	2.5928	21 57 19.3	8.673	10	21 25 29.07	2.3984	12 22 52.9	14.610
11	19 28 1.96	2.5898	21 48 34.2	8.832	11	21 27 52.85	2.3942	12 8 13.9	14.688
12	19 30 37.26	2.5868	21 39 39.5	8.991	12	21 30 16.37	2.3899	11 53 30.3	14.765
13	19 33 12.38	2.5837	21 30 35.3	9.148	13	21 32 39.64	2.3858	11 38 42.1	14.840
14	19 35 47.30	2.5804	21 21 21.7	9.304	14	21 35 2.66	2.3816	11 23 49.5	14.913
15	19 38 22.03	2.5773	21 11 58.8	9.459	15	21 37 25.43	2.3774	11 8 52.5	14.984
16	19 40 56.57	2.5739	21 2 26.6	9.613	16	21 39 47.95	2.3734	10 53 51.4	15.053
17	19 43 30.90	2.5704	20 52 45.2	9.766	17	21 42 10.24	2.3693	10 38 46.2	15.119
18	19 46 5.02	2.5670	20 42 54.7	9.917	18	21 44 32.27	2.3653	10 23 37.1	15.183
19	19 48 38.94	2.5634	20 32 55.2	10.066	19	21 46 54.07	2.3614	10 8 24.2	15.246
20	19 51 12.63	2.5598	20 22 46.8	10.215	20	21 49 15.64	2.3574	9 53 7.6	15.307
21	19 53 46.11	2.5561	20 12 29.4	10.362	21	21 51 36.96	2.3535	9 37 47.4	15.365
22	19 56 19.36	2.5523	20 2 3.4	10.507	22	21 53 58.06	2.3497	9 22 23.8	15.422
23	19 58 52.39	2.5485	-19 51 28.6	+10.651	23	21 56 18.92	2.3458	-9 6 56.8	+15.476
FEBRUARY 19.					FEBRUARY 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 1 25.18	2.5446	-19 40 45.3	+10.793	0	21 58 39.56	2.3421	-8 51 26.7	+15.528
1	20 3 57.74	2.5408	19 29 53.4	10.934	1	22 0 59.97	2.3383	8 35 53.5	15.578
2	20 6 30.07	2.5368	19 18 53.2	11.073	2	22 3 20.16	2.3347	8 20 17.3	15.627
3	20 9 2.15	2.5328	19 7 44.6	11.212	3	22 5 40.13	2.3311	8 4 38.3	15.673
4	20 11 34.00	2.5287	18 56 27.8	11.348	4	22 7 59.89	2.3275	7 48 56.6	15.717
5	20 14 5.59	2.5245	18 45 2.8	11.483	5	22 10 19.43	2.3239	7 33 12.3	15.759
6	20 16 36.94	2.5204	18 33 29.8	11.616	6	22 12 38.76	2.3204	7 17 25.5	15.798
7	20 19 8.04	2.5163	18 21 48.9	11.748	7	22 14 57.88	2.3170	7 1 36.5	15.837
8	20 21 38.89	2.5121	18 10 0.1	11.878	8	22 17 16.80	2.3137	6 45 45.1	15.873
9	20 24 9.49	2.5078	17 58 3.6	12.005	9	22 19 35.52	2.3104	6 29 51.7	15.907
10	20 26 39.82	2.5034	17 45 59.5	12.132	10	22 21 54.05	2.3071	6 13 56.3	15.938
11	20 29 9.90	2.4993	17 33 47.8	12.257	11	22 24 12.37	2.3038	5 57 59.1	15.968
12	20 31 39.73	2.4949	17 21 28.7	12.379	12	22 26 30.50	2.3007	5 42 0.1	15.997
13	20 34 9.29	2.4905	17 9 2.3	12.501	13	22 28 48.45	2.2976	5 25 59.5	16.023
14	20 36 38.59	2.4862	16 56 28.6	12.620	14	22 31 6.21	2.2945	5 9 57.4	16.047
15	20 39 7.63	2.4818	16 43 47.9	12.738	15	22 33 23.79	2.2915	4 53 53.9	16.068
16	20 41 36.41	2.4774	16 31 0.1	12.853	16	22 35 41.19	2.2886	4 37 49.2	16.088
17	20 44 4.92	2.4729	16 18 5.5	12.967	17	22 37 58.42	2.2858	4 21 43.3	16.107
18	20 46 33.16	2.4685	16 5 4.1	13.079	18	22 40 15.48	2.2830	4 5 36.4	16.123
19	20 49 1.14	2.4642	15 51 56.0	13.189	19	22 42 32.38	2.2803	3 49 28.6	16.137
20	20 51 28.86	2.4597	15 38 41.4	13.298	20	22 44 49.11	2.2775	3 33 20.0	16.149
21	20 53 56.30	2.4553	15 25 20.3	13.404	21	22 47 5.68	2.2748	3 17 10.7	16.159
22	20 56 23.49	2.4508	15 11 52.9	13.508	22	22 49 22.09	2.2723	3 1 0.9	16.168
23	20 58 50.40	2.4463	14 58 19.3	13.612	23	22 51 38.35	2.2698	2 44 50.6	16.174
24	21 1 17.05	2.4419	-14 44 39.5	+13.713	24	22 53 54.46	2.2673	-2 28 40.0	+16.178

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 22.					FEBRUARY 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 53 54.46	2.2673	-2 28 40.0	+16.178	0	0 41 4.80	2.2205	+ 9 59 12.8	+14.350
1	22 56 10.43	2.2650	2 12 29.2	16.181	1	0 43 18.04	2.2209	10 13 32.1	14.283
2	22 58 26.26	2.2626	1 56 18.3	16.182	2	0 45 31.31	2.2213	10 27 46.8	14.207
3	23 0 41.94	2.2603	1 40 7.4	16.180	3	0 47 44.60	2.2218	10 41 56.9	14.129
4	23 2 57.50	2.2582	1 23 56.7	16.177	4	0 49 57.92	2.2223	10 56 2.3	14.051
5	23 5 12.92	2.2560	1 7 46.2	16.173	5	0 52 11.27	2.2228	11 10 3.0	13.971
6	23 7 28.22	2.2539	0 51 36.0	16.166	6	0 54 24.65	2.2233	11 23 58.8	13.888
7	23 9 43.39	2.2519	0 35 26.3	16.157	7	0 56 38.07	2.2239	11 37 49.6	13.806
8	23 11 58.45	2.2500	0 19 17.2	16.146	8	0 58 51.52	2.2245	11 51 35.5	13.723
9	23 14 13.39	2.2480	-0 3 8.8	16.133	9	1 1 5.01	2.2253	12 5 16.4	13.638
10	23 16 28.21	2.2462	+0 12 58.8	+16.120	10	1 3 18.55	2.2259	12 18 52.1	13.552
11	23 18 42.93	2.2444	0 29 5.6	16.103	11	1 5 32.12	2.2266	12 32 22.6	13.464
12	23 20 57.54	2.2428	0 45 11.2	16.085	12	1 7 45.74	2.2274	12 45 47.8	13.376
13	23 23 12.06	2.2411	1 1 15.8	16.066	13	1 9 59.41	2.2283	12 59 7.7	13.286
14	23 25 26.47	2.2395	1 17 19.1	16.044	14	1 12 13.14	2.2292	13 12 22.1	13.195
15	23 27 40.80	2.2381	1 33 21.1	16.022	15	1 14 26.91	2.2300	13 25 31.1	13.104
16	23 29 55.04	2.2366	1 49 21.7	15.998	16	1 16 40.74	2.2309	13 38 34.6	13.011
17	23 32 9.19	2.2352	2 5 20.8	15.970	17	1 18 54.62	2.2318	13 51 32.4	12.916
18	23 34 23.26	2.2338	2 21 18.1	15.942	18	1 21 8.56	2.2328	14 4 24.5	12.822
19	23 36 37.25	2.2325	2 37 13.8	15.913	19	1 23 22.55	2.2338	14 17 11.0	12.726
20	23 38 51.16	2.2313	2 53 7.6	15.881	20	1 25 36.61	2.2348	14 29 51.6	12.629
21	23 41 5.01	2.2303	3 8 59.5	15.848	21	1 27 50.73	2.2359	14 42 26.4	12.531
22	23 43 18.79	2.2291	3 24 49.3	15.812	22	1 30 4.92	2.2369	14 54 55.3	12.432
23	23 45 32.50	2.2280	+3 40 36.9	+15.775	23	1 32 19.16	2.2379	+15 7 18.2	+12.331
FEBRUARY 23.					FEBRUARY 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 47 46.15	2.2271	+3 56 22.3	+15.738	0	1 34 33.47	2.2391	+15 19 35.0	+12.229
1	23 49 59.75	2.2263	4 12 5.4	15.698	1	1 36 47.85	2.2403	15 31 45.7	12.128
2	23 52 13.30	2.2253	4 27 46.0	15.655	2	1 39 2.30	2.2414	15 43 50.3	12.025
3	23 54 26.79	2.2245	4 43 24.0	15.612	3	1 41 16.82	2.2426	15 55 48.7	11.921
4	23 56 40.24	2.2238	4 58 59.4	15.568	4	1 43 31.41	2.2438	16 7 40.8	11.815
5	23 58 53.65	2.2232	5 14 32.1	15.522	5	1 45 46.07	2.2449	16 19 26.5	11.709
6	0 1 7.02	2.2226	5 30 2.0	15.473	6	1 48 0.80	2.2461	16 31 5.9	11.603
7	0 3 20.36	2.2220	5 45 28.9	15.423	7	1 50 15.60	2.2473	16 42 38.9	11.496
8	0 5 33.66	2.2215	6 0 52.8	15.373	8	1 52 30.48	2.2486	16 54 5.4	11.387
9	0 7 46.94	2.2211	6 16 13.6	15.320	9	1 54 45.43	2.2498	17 5 25.3	11.277
10	0 10 0.19	2.2206	6 31 31.2	15.266	10	1 57 0.46	2.2511	17 16 38.6	11.167
11	0 12 13.41	2.2203	6 46 45.5	15.210	11	1 59 15.56	2.2523	17 27 45.3	11.057
12	0 14 26.62	2.2200	7 1 56.4	15.153	12	2 1 30.73	2.2535	17 38 45.4	10.945
13	0 16 39.81	2.2198	7 17 3.9	15.095	13	2 3 45.98	2.2548	17 49 38.7	10.832
14	0 18 53.00	2.2197	7 32 7.8	15.035	14	2 6 1.31	2.2562	18 0 25.2	10.718
15	0 21 6.17	2.2195	7 47 8.1	14.973	15	2 8 16.72	2.2574	18 11 4.9	10.604
16	0 23 19.34	2.2194	8 2 4.6	14.911	16	2 10 32.20	2.2587	18 21 37.7	10.489
17	0 25 32.50	2.2193	8 16 57.4	14.847	17	2 12 47.76	2.2600	18 32 3.6	10.373
18	0 27 45.66	2.2194	8 31 46.2	14.780	18	2 15 3.40	2.2613	18 42 22.5	10.257
19	0 29 58.83	2.2195	8 46 31.0	14.713	19	2 17 19.11	2.2624	18 52 34.4	10.140
20	0 32 12.00	2.2196	9 1 11.8	14.646	20	2 19 34.89	2.2638	19 2 39.3	10.023
21	0 34 25.18	2.2198	9 15 48.5	14.576	21	2 21 50.76	2.2651	19 12 37.1	9.903
22	0 36 38.37	2.2200	9 30 20.9	14.504	22	2 24 6.70	2.2663	19 22 27.7	9.781
23	0 38 51.58	2.2203	9 44 49.0	14.433	23	2 26 22.71	2.2675	19 32 11.2	9.665
24	0 41 4.80	2.2205	+9 59 12.8	+14.359	24	2 28 38.80	2.2688	+19 41 47.5	+ 9.544

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 26.					FEBRUARY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 28 38.80	2.2688	+19 41 47.5	+9.544	0	4 18 30.09	2.2939	+24 52 5.4	+3.271
1	2 30 54.96	2.2700	19 51 16.5	9.423	1	4 20 47.71	2.2933	24 55 17.6	3.136
2	2 33 11.20	2.2713	20 0 38.2	9.301	2	4 23 5.28	2.2926	24 58 21.7	3.001
3	2 35 27.51	2.2724	20 9 52.6	9.179	3	4 25 22.82	2.2919	25 1 17.7	2.866
4	2 37 43.89	2.2736	20 18 59.7	9.066	4	4 27 40.31	2.2912	25 4 5.6	2.731
5	2 40 0.34	2.2748	20 27 59.3	8.932	5	4 29 57.76	2.2903	25 6 45.4	2.597
6	2 42 16.86	2.2759	20 36 51.5	8.808	6	4 32 15.15	2.2894	25 9 17.2	2.462
7	2 44 33.45	2.2771	20 45 36.3	8.683	7	4 34 32.49	2.2885	25 11 40.8	2.327
8	2 46 50.11	2.2782	20 54 13.5	8.558	8	4 36 49.77	2.2875	25 13 56.4	2.193
9	2 49 6.83	2.2793	21 2 43.3	8.433	9	4 39 6.99	2.2865	25 16 3.9	2.058
10	2 51 23.62	2.2803	21 11 5.4	8.306	10	4 41 24.15	2.2853	25 18 3.4	1.924
11	2 53 40.47	2.2813	21 19 20.0	8.179	11	4 43 41.23	2.2841	25 19 54.8	1.790
12	2 55 57.38	2.2824	21 27 26.9	8.062	12	4 45 58.24	2.2829	25 21 38.2	1.657
13	2 58 14.36	2.2834	21 35 26.2	7.924	13	4 48 15.18	2.2817	25 23 13.6	1.523
14	3 0 31.39	2.2843	21 43 17.8	7.797	14	4 50 32.04	2.2803	25 24 40.9	1.389
15	3 2 48.48	2.2853	21 51 1.8	7.668	15	4 52 48.81	2.2788	25 26 0.3	1.257
16	3 5 5.63	2.2863	21 58 37.9	7.538	16	4 55 5.50	2.2774	25 27 11.7	1.123
17	3 7 22.83	2.2871	22 6 6.4	7.409	17	4 57 22.10	2.2759	25 28 15.1	0.991
18	3 9 40.08	2.2879	22 13 27.0	7.279	18	4 59 38.61	2.2743	25 29 10.6	0.859
19	3 11 57.38	2.2888	22 20 39.9	7.149	19	5 1 55.02	2.2727	25 29 58.2	0.727
20	3 14 14.73	2.2896	22 27 44.9	7.018	20	5 4 11.33	2.2709	25 30 37.8	0.594
21	3 16 32.13	2.2903	22 34 42.1	6.888	21	5 6 27.53	2.2693	25 31 9.5	0.463
22	3 18 49.57	2.2910	22 41 31.4	6.756	22	5 8 43.64	2.2676	25 31 33.4	0.332
23	3 21 7.05	2.2918	+22 48 12.8	+6.625	23	5 10 59.63	2.2655	+25 31 49.3	+0.201
FEBRUARY 27.					MARCH 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 23 24.58	2.2924	+22 54 46.4	+6.493	0	5 13 15.50	2.2636	+25 31 57.5	+0.071
1	3 25 42.14	2.2930	23 1 12.0	6.361	1	5 15 31.26	2.2617	25 31 57.8	-0.060
2	3 27 59.74	2.2935	23 7 29.7	6.228	2	5 17 46.90	2.2596	25 31 50.3	0.190
3	3 30 17.36	2.2940	23 13 39.4	6.096	3	5 20 2.41	2.2575	25 31 35.0	0.320
4	3 32 35.02	2.2945	23 19 41.2	5.963	4	5 22 17.80	2.2554	25 31 11.9	0.448
5	3 34 52.70	2.2949	23 25 34.9	5.829	5	5 24 33.06	2.2532	25 30 41.2	0.578
6	3 37 10.41	2.2953	23 31 20.7	5.696	6	5 26 48.18	2.2509	25 30 2.6	0.707
7	3 39 28.14	2.2957	23 36 58.4	5.563	7	5 29 3.17	2.2487	25 29 16.4	0.833
8	3 41 45.89	2.2960	23 42 28.2	5.428	8	5 31 18.02	2.2463	25 28 22.6	0.961
9	3 44 3.66	2.2963	23 47 49.8	5.294	9	5 33 32.72	2.2438	25 27 21.1	1.089
10	3 46 21.44	2.2964	23 53 3.5	5.161	10	5 35 47.28	2.2414	25 26 11.9	1.216
11	3 48 39.23	2.2965	23 58 9.1	5.025	11	5 38 1.69	2.2389	25 24 55.2	1.342
12	3 50 57.02	2.2966	24 3 6.5	4.890	12	5 40 15.95	2.2363	25 23 30.9	1.468
13	3 53 14.82	2.2968	24 7 55.9	4.757	13	5 42 30.05	2.2338	25 21 59.1	1.593
14	3 55 32.63	2.2968	24 12 37.3	4.623	14	5 44 44.00	2.2311	25 20 19.8	1.718
15	3 57 50.43	2.2968	24 17 10.6	4.487	15	5 46 57.78	2.2283	25 18 33.0	1.843
16	4 0 8.24	2.2967	24 21 35.7	4.352	16	5 49 11.40	2.2256	25 16 38.7	1.966
17	4 2 26.03	2.2964	24 25 52.8	4.218	17	5 51 24.85	2.2228	25 14 37.1	2.089
18	4 4 43.81	2.2963	24 30 1.8	4.083	18	5 53 38.13	2.2199	25 12 28.0	2.213
19	4 7 1.58	2.2960	24 34 2.7	3.948	19	5 55 51.24	2.2171	25 10 11.6	2.335
20	4 9 19.33	2.2956	24 37 55.5	3.812	20	5 58 4.18	2.2142	25 7 47.8	2.457
21	4 11 37.05	2.2953	24 41 40.1	3.677	21	6 0 16.94	2.2112	25 5 16.8	2.578
22	4 13 54.76	2.2949	24 45 16.7	3.542	22	6 2 29.52	2.2082	25 2 38.5	2.699
23	4 16 12.44	2.2944	24 48 45.1	3.406	23	6 4 41.92	2.2051	24 59 52.9	2.819
24	4 18 30.09	2.2939	+24 52 5.4	+3.271	24	6 6 54.13	2.2020	+24 57 0.2	-2.938

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 2.					MARCH 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 6 54.13	2.2020	+24 57 0.2	-2.038	0	7 48 31.78	2.0274	+20 29 59.3	-7.925
1	6 9 6.16	2.1989	24 54 0.3	3.058	1	7 50 33.31	2.0236	20 22 1.2	8.012
2	6 11 18.00	2.1967	24 50 53.3	3.177	2	7 52 34.61	2.0198	20 13 57.9	8.098
3	6 13 29.64	2.1925	24 47 39.1	3.295	3	7 54 35.69	2.0162	20 5 49.5	8.183
4	6 15 41.10	2.1893	24 44 17.9	3.412	4	7 56 36.55	2.0124	19 57 36.0	8.267
5	6 17 52.35	2.1859	24 40 49.7	3.528	5	7 58 37.18	2.0087	19 49 17.5	8.350
6	6 20 3.41	2.1827	24 37 14.5	3.645	6	8 0 37.59	2.0051	19 40 54.0	8.433
7	6 22 14.27	2.1793	24 33 32.3	3.761	7	8 2 37.79	2.0014	19 32 25.5	8.516
8	6 24 24.93	2.1760	24 29 43.2	3.876	8	8 4 37.76	1.9978	19 23 52.1	8.597
9	6 26 35.39	2.1726	24 25 47.2	3.990	9	8 6 37.52	1.9942	19 15 13.9	8.678
10	6 28 45.64	2.1691	24 21 44.4	4.104	10	8 8 37.06	1.9905	19 6 30.8	8.758
11	6 30 55.68	2.1656	24 17 34.7	4.218	11	8 10 36.38	1.9869	18 57 43.0	8.836
12	6 33 5.51	2.1622	24 13 18.3	4.339	12	8 12 35.49	1.9833	18 48 50.5	8.914
13	6 35 15.14	2.1587	24 8 55.2	4.442	13	8 14 34.38	1.9798	18 39 53.3	8.993
14	6 37 24.55	2.1551	24 4 25.3	4.553	14	8 16 33.07	1.9763	18 30 51.4	9.070
15	6 39 33.75	2.1515	23 59 48.8	4.663	15	8 18 31.54	1.9728	18 21 44.9	9.146
16	6 41 42.73	2.1479	23 55 5.8	4.773	16	8 20 29.80	1.9693	18 12 33.9	9.221
17	6 43 51.50	2.1443	23 50 16.1	4.883	17	8 22 27.85	1.9658	18 3 18.4	9.296
18	6 46 0.06	2.1407	23 45 19.9	4.991	18	8 24 25.70	1.9624	17 53 58.4	9.370
19	6 48 8.38	2.1370	23 40 17.2	5.099	19	8 26 23.34	1.9591	17 44 34.0	9.443
20	6 50 16.49	2.1334	23 35 8.0	5.207	20	8 28 20.79	1.9557	17 35 5.3	9.515
21	6 52 24.39	2.1298	23 29 52.4	5.313	21	8 30 18.02	1.9523	17 25 32.2	9.588
22	6 54 32.06	2.1259	23 24 30.5	5.418	22	8 32 15.06	1.9490	17 15 54.8	9.658
23	6 56 39.50	2.1223	+23 19 2.2	-5.524	23	8 34 11.90	1.9458	+17 6 13.2	-9.728
MARCH 3.					MARCH 5.				
0	6 58 46.73	2.1186	+23 13 27.6	-5.628	0	8 36 8.55	1.9425	+16 56 27.4	-9.798
1	7 0 53.73	2.1148	23 7 46.8	5.733	1	8 38 5.00	1.9393	16 46 37.5	9.867
2	7 3 0.50	2.1110	23 1 59.7	5.836	2	8 40 1.26	1.9361	16 36 43.4	9.935
3	7 5 7.05	2.1073	22 56 6.5	5.938	3	8 41 57.33	1.9328	16 26 45.3	10.003
4	7 7 13.37	2.1034	22 50 7.1	6.040	4	8 43 53.20	1.9297	16 16 43.1	10.069
5	7 9 19.46	2.0997	22 44 1.7	6.141	5	8 45 48.89	1.9267	16 6 37.0	10.134
6	7 11 25.33	2.0968	22 37 50.2	6.241	6	8 47 44.40	1.9237	15 56 27.0	10.199
7	7 13 30.96	2.0920	22 31 32.8	6.341	7	8 49 39.73	1.9206	15 46 13.1	10.264
8	7 15 36.37	2.0883	22 25 9.3	6.441	8	8 51 34.87	1.9176	15 35 55.3	10.328
9	7 17 41.55	2.0845	22 18 39.9	6.538	9	8 53 29.84	1.9146	15 25 33.7	10.391
10	7 19 46.51	2.0807	22 12 4.7	6.636	10	8 55 24.62	1.9117	15 15 8.4	10.453
11	7 21 51.23	2.0768	22 5 23.6	6.733	11	8 57 19.24	1.9088	15 4 39.4	10.514
12	7 23 55.72	2.0729	21 58 36.8	6.828	12	8 59 13.68	1.9059	14 54 6.7	10.575
13	7 25 59.98	2.0692	21 51 44.2	6.924	13	9 1 7.95	1.9032	14 43 30.4	10.635
14	7 28 4.02	2.0653	21 44 45.9	7.018	14	9 3 2.06	1.9003	14 32 50.5	10.694
15	7 30 7.82	2.0615	21 37 42.0	7.113	15	9 4 55.99	1.8976	14 22 7.1	10.753
16	7 32 11.40	2.0577	21 30 32.4	7.206	16	9 6 49.77	1.8950	14 11 20.2	10.811
17	7 34 14.74	2.0538	21 23 17.3	7.298	17	9 8 43.39	1.8923	14 0 29.8	10.868
18	7 36 17.86	2.0501	21 15 56.7	7.389	18	9 10 36.84	1.8896	13 49 36.1	10.923
19	7 38 20.75	2.0463	21 8 30.6	7.481	19	9 12 30.14	1.8871	13 38 39.0	10.979
20	7 40 23.41	2.0424	21 0 59.0	7.571	20	9 14 23.29	1.8846	13 27 38.6	11.034
21	7 42 25.84	2.0386	20 53 22.1	7.660	21	9 16 16.29	1.8820	13 16 34.9	11.088
22	7 44 28.04	2.0348	20 45 39.8	7.749	22	9 18 9.13	1.8796	13 5 28.0	11.141
23	7 46 30.02	2.0312	20 37 52.2	7.838	23	9 20 1.84	1.8772	12 54 18.0	11.193
24	7 48 31.78	2.0274	+20 29 59.3	-7.925	24	9 21 54.39	1.8748	+12 43 4.8	-11.246

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 6.					MARCH 8.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	9 21 54.39	1.8748	+12 43 4.8	-11.246	0	10 50 3.67	1.8178	+2 57 21.5	-12.877
1	9 23 46.81	1.8725	12 31 48.5	11.298	1	10 51 52.74	1.8179	2 44 28.4	12.893
2	9 25 39.09	1.8702	12 20 29.1	11.348	2	10 53 41.82	1.8181	2 31 34.4	12.908
3	9 27 31.23	1.8679	12 9 6.8	11.397	3	10 55 30.91	1.8183	2 18 39.5	12.923
4	9 29 23.24	1.8658	11 57 41.5	11.447	4	10 57 20.02	1.8186	2 5 43.7	12.936
5	9 31 15.12	1.8636	11 46 13.2	11.495	5	10 59 9.14	1.8189	1 52 47.2	12.948
6	9 33 6.87	1.8614	11 34 42.1	11.542	6	11 0 58.29	1.8193	1 39 49.9	12.961
7	9 34 58.49	1.8594	11 23 8.2	11.588	7	11 2 47.46	1.8197	1 26 51.9	12.972
8	9 36 50.00	1.8574	11 11 31.5	11.635	8	11 4 36.65	1.8202	1 13 53.3	12.982
9	9 38 41.38	1.8554	10 59 52.0	11.680	9	11 6 25.88	1.8206	1 0 54.1	12.992
10	9 40 32.65	1.8535	10 48 9.9	11.724	10	11 8 15.15	1.8214	0 47 54.3	13.002
11	9 42 23.80	1.8516	10 36 25.1	11.768	11	11 10 4.45	1.8220	0 34 53.9	13.009
12	9 44 14.84	1.8498	10 24 37.7	11.812	12	11 11 53.79	1.8228	0 21 53.2	13.016
13	9 46 5.78	1.8481	10 12 47.7	11.854	13	11 13 43.18	1.8236	+0 8 52.0	13.023
14	9 47 56.61	1.8463	10 0 55.2	11.896	14	11 15 32.62	1.8244	-0 4 9.6	13.028
15	9 49 47.33	1.8446	9 49 0.2	11.938	15	11 17 22.11	1.8253	0 17 11.4	13.033
16	9 51 37.96	1.8430	9 37 2.7	11.978	16	11 19 11.66	1.8263	0 30 13.6	13.038
17	9 53 28.49	1.8414	9 25 2.9	12.017	17	11 21 1.26	1.8273	0 43 16.0	13.042
18	9 55 18.93	1.8399	9 13 0.7	12.055	18	11 22 50.93	1.8284	0 56 18.6	13.044
19	9 57 9.28	1.8383	9 0 56.3	12.093	19	11 24 40.67	1.8296	1 9 21.3	13.046
20	9 58 59.53	1.8369	8 48 49.5	12.131	20	11 26 30.47	1.8307	1 22 24.1	13.047
21	10 0 49.71	1.8356	8 36 40.6	12.167	21	11 28 20.35	1.8319	1 35 26.9	13.047
22	10 2 39.80	1.8342	8 24 29.5	12.203	22	11 30 10.30	1.8333	1 48 29.7	13.047
23	10 4 29.81	1.8329	+ 8 12 16.2	-12.238	23	11 32 0.34	1.8346	-2 1 32.5	-13.045
MARCH 7.					MARCH 9.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	10 6 19.75	1.8317	+ 8 0 0.9	-12.273	0	11 33 50.45	1.8360	-2 14 35.1	-13.043
1	10 8 9.61	1.8305	7 47 43.5	12.307	1	11 35 40.66	1.8375	2 27 37.6	13.040
2	10 9 59.41	1.8293	7 35 24.1	12.340	2	11 37 30.95	1.8390	2 40 39.9	13.036
3	10 11 49.13	1.8283	7 23 2.7	12.372	3	11 39 21.34	1.8407	2 53 41.9	13.031
4	10 13 38.80	1.8273	7 10 39.5	12.408	4	11 41 11.83	1.8423	3 6 43.6	13.025
5	10 15 28.40	1.8263	6 58 14.3	12.434	5	11 43 2.42	1.8440	3 19 44.9	13.019
6	10 17 17.95	1.8253	6 45 47.4	12.463	6	11 44 53.11	1.8458	3 32 45.9	13.013
7	10 19 7.44	1.8244	6 33 18.7	12.493	7	11 46 43.91	1.8477	3 45 46.4	13.008
8	10 20 56.88	1.8237	6 20 48.2	12.522	8	11 48 34.83	1.8496	3 58 46.3	12.994
9	10 22 46.28	1.8229	6 8 16.1	12.549	9	11 50 25.86	1.8515	4 11 45.7	12.986
10	10 24 35.63	1.8222	5 55 42.3	12.577	10	11 52 17.01	1.8535	4 24 44.6	12.975
11	10 26 24.94	1.8215	5 43 6.9	12.603	11	11 54 8.28	1.8555	4 37 42.7	12.963
12	10 28 14.21	1.8208	5 30 30.0	12.628	12	11 55 59.67	1.8576	4 50 40.1	12.951
13	10 30 3.44	1.8203	5 17 51.5	12.653	13	11 57 51.19	1.8598	5 3 36.8	12.938
14	10 31 52.65	1.8198	5 5 11.6	12.677	14	11 59 42.85	1.8621	5 16 32.6	12.923
15	10 33 41.82	1.8193	4 52 30.3	12.701	15	12 1 34.64	1.8644	5 29 27.6	12.909
16	10 35 30.97	1.8190	4 39 47.5	12.724	16	12 3 26.58	1.8668	5 42 21.7	12.893
17	10 37 20.10	1.8187	4 27 3.4	12.745	17	12 5 18.65	1.8692	5 55 14.8	12.877
18	10 39 9.21	1.8183	4 14 18.1	12.766	18	12 7 10.88	1.8717	6 8 6.9	12.859
19	10 40 58.30	1.8182	4 1 31.5	12.787	19	12 9 3.25	1.8742	6 20 57.9	12.841
20	10 42 47.39	1.8180	3 48 43.7	12.807	20	12 10 55.78	1.8768	6 33 47.8	12.822
21	10 44 36.46	1.8178	3 35 54.7	12.825	21	12 12 48.47	1.8794	6 46 36.5	12.802
22	10 46 25.53	1.8178	3 23 4.7	12.843	22	12 14 41.31	1.8822	6 59 24.0	12.781
23	10 48 14.60	1.8178	3 10 13.6	12.860	23	12 16 34.33	1.8850	7 12 10.2	12.758
24	10 50 3.67	1.8178	+ 2 57 21.5	-12.877	24	12 18 27.51	1.8878	-7 24 55.0	-12.735

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 10.					MARCH 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 18 27.51	1.8878	-7 24 55.0	-12.785	0	13 53 22.77	2.0668	-16 51 37.7	-10.484
1	12 20 20.86	1.8907	7 37 38.4	12.712	1	13 55 28.14	2.0922	17 2 4.6	10.411
2	12 22 14.39	1.8936	7 50 20.4	12.688	2	13 57 33.83	2.0974	17 12 27.0	10.337
3	12 24 8.09	1.8966	8 3 0.9	12.663	3	13 59 39.83	2.1028	17 22 45.0	10.263
4	12 26 1.98	1.8997	8 15 39.9	12.636	4	14 1 46.16	2.1082	17 32 58.5	10.186
5	12 27 56.05	1.9028	8 28 17.2	12.606	5	14 3 52.81	2.1136	17 43 7.3	10.108
6	12 29 50.31	1.9059	8 40 52.8	12.579	6	14 5 59.79	2.1191	17 53 11.4	10.029
7	12 31 44.76	1.9092	8 53 26.7	12.551	7	14 8 7.10	2.1245	18 3 10.8	9.949
8	12 33 39.41	1.9125	9 5 58.9	12.521	8	14 10 14.73	2.1300	18 13 5.3	9.868
9	12 35 34.26	1.9158	9 18 29.2	12.488	9	14 12 22.70	2.1355	18 22 55.0	9.787
10	12 37 29.30	1.9192	9 30 57.5	12.457	10	14 14 30.99	2.1410	18 32 39.7	9.703
11	12 39 24.56	1.9227	9 43 24.0	12.424	11	14 16 39.62	2.1467	18 42 19.3	9.618
12	12 41 20.02	1.9262	9 55 48.4	12.389	12	14 18 48.59	2.1523	18 51 53.9	9.533
13	12 43 15.70	1.9298	10 8 10.7	12.355	13	14 20 57.89	2.1579	19 1 23.3	9.446
14	12 45 11.59	1.9333	10 20 31.0	12.319	14	14 23 7.54	2.1636	19 10 47.4	9.358
15	12 47 7.70	1.9370	10 32 49.0	12.282	15	14 25 17.52	2.1692	19 20 6.2	9.268
16	12 49 4.03	1.9408	10 45 4.8	12.243	16	14 27 27.84	2.1748	19 29 19.6	9.178
17	12 51 0.59	1.9446	10 57 18.2	12.204	17	14 29 38.50	2.1805	19 38 27.6	9.087
18	12 52 57.38	1.9484	11 9 29.3	12.165	18	14 31 49.50	2.1863	19 47 30.0	8.993
19	12 54 54.40	1.9523	11 21 38.0	12.124	19	14 34 0.85	2.1920	19 56 26.8	8.899
20	12 56 51.66	1.9563	11 33 44.2	12.082	20	14 36 12.54	2.1978	20 5 17.9	8.804
21	12 58 49.15	1.9603	11 45 47.8	12.039	21	14 38 24.58	2.2035	20 14 3.3	8.708
22	13 0 46.89	1.9643	11 57 48.9	11.996	22	14 40 36.96	2.2092	20 22 42.9	8.611
23	13 2 44.87	1.9684	-12 9 47.3	-11.950	23	14 42 49.68	2.2149	-20 31 16.6	-8.512
MARCH 11.					MARCH 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 4 43.10	1.9726	-12 21 42.9	-11.904	0	14 45 2.75	2.2208	-20 39 44.3	-8.412
1	13 6 41.58	1.9768	12 33 35.8	11.858	1	14 47 16.17	2.2265	20 48 6.0	8.311
2	13 8 40.32	1.9811	12 45 25.8	11.809	2	14 49 29.93	2.2323	20 56 21.6	8.208
3	13 10 39.31	1.9854	12 57 12.9	11.760	3	14 51 44.04	2.2381	21 4 31.0	8.105
4	13 12 38.57	1.9898	13 8 57.0	11.710	4	14 53 58.50	2.2438	21 12 34.2	8.001
5	13 14 38.08	1.9942	13 20 38.1	11.659	5	14 56 13.30	2.2496	21 20 31.1	7.894
6	13 16 37.87	1.9987	13 32 16.1	11.608	6	14 58 28.45	2.2554	21 28 21.5	7.788
7	13 18 37.92	2.0032	13 43 51.0	11.554	7	15 0 43.95	2.2612	21 36 5.6	7.680
8	13 20 38.25	2.0078	13 55 22.6	11.500	8	15 2 59.79	2.2669	21 43 43.1	7.570
9	13 22 38.85	2.0123	14 6 51.0	11.445	9	15 5 15.98	2.2727	21 51 14.0	7.459
10	13 24 39.73	2.0170	14 18 16.0	11.388	10	15 7 32.51	2.2783	21 58 38.2	7.348
11	13 26 40.89	2.0218	14 29 37.6	11.331	11	15 9 49.38	2.2841	22 5 55.7	7.235
12	13 28 42.34	2.0265	14 40 55.7	11.273	12	15 12 6.60	2.2898	22 13 6.4	7.121
13	13 30 44.07	2.0313	14 52 10.3	11.213	13	15 14 24.16	2.2955	22 20 10.2	7.006
14	13 32 46.09	2.0361	15 3 21.2	11.152	14	15 16 42.06	2.3012	22 27 7.1	6.889
15	13 34 48.40	2.0410	15 14 28.5	11.090	15	15 19 0.30	2.3068	22 33 56.9	6.771
16	13 36 51.01	2.0460	15 25 32.0	11.028	16	15 21 18.88	2.3124	22 40 39.6	6.653
17	13 38 53.92	2.0509	15 36 31.8	10.963	17	15 23 37.79	2.3180	22 47 15.2	6.533
18	13 40 57.12	2.0559	15 47 27.6	10.898	18	15 25 57.04	2.3236	22 53 43.5	6.412
19	13 43 0.63	2.0610	15 58 19.6	10.833	19	15 28 16.62	2.3291	23 0 4.6	6.289
20	13 45 4.44	2.0661	16 9 7.5	10.764	20	15 30 36.53	2.3347	23 6 18.2	6.166
21	13 47 8.56	2.0712	16 19 51.3	10.696	21	15 32 56.78	2.3402	23 12 24.5	6.042
22	13 49 12.98	2.0763	16 30 31.0	10.627	22	15 35 17.35	2.3455	23 18 23.2	5.916
23	13 51 17.72	2.0816	16 41 6.5	10.556	23	15 37 38.24	2.3509	23 24 14.4	5.790
24	13 53 22.77	2.0868	-16 51 37.7	-10.484	24	15 39 59.46	2.3563	-23 29 58.0	-5.663

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 14.					MARCH 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 39 59.46	2.3563	-23 29 58.0	-5.663	0	17 38 4.57	2.5315	-25 16 28.1	+1.511
1	15 42 21.00	2.3617	23 35 33.9	5.533	1	17 40 36.50	2.5328	25 14 52.6	1.674
2	15 44 42.86	2.3670	23 41 1.9	5.403	2	17 43 8.51	2.5340	25 13 7.2	1.838
3	15 47 5.04	2.3723	23 46 22.2	5.272	3	17 45 40.58	2.5351	25 11 12.0	2.002
4	15 49 27.53	2.3774	23 51 34.5	5.139	4	17 48 12.72	2.5362	25 9 7.0	2.166
5	15 51 50.33	2.3825	23 56 38.9	5.007	5	17 50 44.92	2.5370	25 6 52.1	2.330
6	15 54 13.43	2.3876	24 1 35.3	4.873	6	17 53 17.16	2.5378	25 4 27.4	2.493
7	15 56 36.84	2.3927	24 6 23.6	4.737	7	17 55 49.45	2.5385	25 1 52.9	2.658
8	15 59 0.55	2.3977	24 11 3.7	4.600	8	17 58 21.78	2.5390	24 59 8.5	2.823
9	16 1 24.56	2.4026	24 15 35.6	4.463	9	18 0 54.13	2.5394	24 56 14.2	2.987
10	16 3 48.86	2.4074	24 19 59.3	4.325	10	18 3 26.51	2.5398	24 53 10.1	3.150
11	16 6 13.45	2.4123	24 24 14.6	4.186	11	18 5 58.91	2.5401	24 49 56.2	3.314
12	16 8 38.33	2.4170	24 28 21.6	4.046	12	18 8 31.32	2.5402	24 46 32.4	3.478
13	16 11 3.49	2.4217	24 32 20.1	3.904	13	18 11 3.73	2.5402	24 42 58.8	3.643
14	16 13 28.93	2.4263	24 36 10.1	3.762	14	18 13 36.14	2.5401	24 39 15.3	3.807
15	16 15 54.65	2.4308	24 39 51.5	3.619	15	18 16 8.54	2.5398	24 35 22.0	3.970
16	16 18 20.63	2.4353	24 43 24.4	3.475	16	18 18 40.92	2.5396	24 31 18.9	4.133
17	16 20 46.88	2.4397	24 46 48.5	3.329	17	18 21 13.29	2.5392	24 27 6.0	4.297
18	16 23 13.39	2.4440	24 50 3.9	3.184	18	18 23 45.62	2.5387	24 22 43.3	4.459
19	16 25 40.16	2.4483	24 53 10.6	3.038	19	18 26 17.93	2.5381	24 18 10.9	4.622
20	16 28 7.19	2.4524	24 56 8.4	2.890	20	18 28 50.19	2.5373	24 13 28.7	4.784
21	16 30 34.45	2.4565	24 58 57.4	2.742	21	18 31 22.41	2.5366	24 8 36.8	4.946
22	16 33 1.97	2.4606	25 1 37.4	2.592	22	18 33 54.58	2.5357	24 3 35.2	5.108
23	16 35 29.72	2.4644	-25 4 8.4	-2.442	23	18 36 26.69	2.5347	-25 58 23.8	+5.270
MARCH 15.					MARCH 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 37 57.70	2.4683	-25 6 30.4	-2.291	0	18 38 58.74	2.5336	-23 53 2.8	+5.430
1	16 40 25.91	2.4721	25 8 48.3	2.139	1	18 41 30.72	2.5323	23 47 32.2	5.590
2	16 42 54.35	2.4758	25 10 47.1	1.988	2	18 44 2.62	2.5311	23 41 52.0	5.751
3	16 45 23.00	2.4793	25 12 41.8	1.834	3	18 46 34.45	2.5298	23 36 2.1	5.910
4	16 47 51.86	2.4828	25 14 27.2	1.680	4	18 49 6.19	2.5283	23 30 2.8	6.068
5	16 50 20.93	2.4862	25 16 3.4	1.526	5	18 51 37.84	2.5267	23 23 53.9	6.227
6	16 52 50.20	2.4894	25 17 30.3	1.371	6	18 54 9.39	2.5250	23 17 35.6	6.384
7	16 55 19.66	2.4927	25 18 47.9	1.215	7	18 56 40.84	2.5233	23 11 7.8	6.542
8	16 57 49.32	2.4958	25 19 56.1	1.058	8	18 59 12.19	2.5216	23 4 30.6	6.698
9	17 0 19.16	2.4988	25 20 54.9	0.902	9	19 1 43.43	2.5197	22 57 44.0	6.854
10	17 2 49.17	2.5017	25 21 44.3	0.745	10	19 4 14.55	2.5177	22 50 48.1	7.008
11	17 5 19.36	2.5045	25 22 24.3	0.587	11	19 6 45.55	2.5157	22 43 43.0	7.163
12	17 7 49.71	2.5072	25 22 54.7	0.428	12	19 9 16.43	2.5136	22 36 28.6	7.317
13	17 10 20.22	2.5098	25 23 15.6	0.268	13	19 11 47.18	2.5113	22 29 5.0	7.470
14	17 12 50.89	2.5123	25 23 26.9	-0.108	14	19 14 17.79	2.5090	22 21 32.2	7.622
15	17 15 21.70	2.5147	25 23 28.6	+0.052	15	19 16 48.26	2.5067	22 13 50.4	7.773
16	17 17 52.65	2.5170	25 23 20.7	0.212	16	19 19 18.59	2.5043	22 5 59.5	7.923
17	17 20 23.74	2.5192	25 23 3.2	0.373	17	19 21 48.78	2.5018	21 57 59.6	8.073
18	17 22 54.95	2.5213	25 22 35.9	0.535	18	19 24 18.81	2.4993	21 49 50.7	8.222
19	17 25 26.29	2.5233	25 21 59.0	0.696	19	19 26 48.69	2.4967	21 41 33.0	8.369
20	17 27 57.74	2.5251	25 21 12.4	0.858	20	19 29 18.41	2.4940	21 33 6.4	8.517
21	17 30 29.30	2.5268	25 20 16.0	1.022	21	19 31 47.97	2.4913	21 24 31.0	8.663
22	17 33 0.96	2.5285	25 19 9.8	1.184	22	19 34 17.37	2.4885	21 15 46.9	8.807
23	17 35 32.72	2.5301	25 17 53.9	1.348	23	19 36 46.59	2.4857	21 6 54.2	8.951
24	17 38 4.57	2.5315	-25 16 28.1	+1.511	24	19 39 15.65	2.4828	-20 57 52.8	+9.094

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 18.					MARCH 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 39 15.65	2.4828	-20 57 52.8	+ 9.094	0	21 34 37.41	2.8233	-11 20 43.1	+14.395
1	19 41 44.53	2.4799	20 48 42.9	9.236	1	21 36 56.72	2.8203	11 6 17.2	14.468
2	19 44 13.24	2.4769	20 39 24.5	9.377	2	21 39 15.85	2.8173	10 51 47.0	14.539
3	19 46 41.76	2.4738	20 29 57.7	9.516	3	21 41 34.80	2.8144	10 37 12.5	14.608
4	19 49 10.10	2.4708	20 20 22.6	9.655	4	21 43 53.58	2.8116	10 22 34.1	14.674
5	19 51 38.25	2.4677	20 10 39.1	9.793	5	21 46 12.19	2.8088	10 7 51.6	14.741
6	19 54 6.22	2.4646	20 0 47.5	9.928	6	21 48 30.63	2.8068	9 53 5.2	14.804
7	19 56 34.00	2.4613	19 50 47.7	10.064	7	21 50 48.89	2.8031	9 38 15.1	14.865
8	19 59 1.58	2.4581	19 40 39.8	10.198	8	21 53 7.00	2.8004	9 23 21.4	14.925
9	20 1 28.97	2.4548	19 30 24.0	10.330	9	21 55 24.94	2.7977	9 8 24.1	14.984
10	20 3 56.16	2.4516	19 20 0.2	10.462	10	21 57 42.72	2.7951	8 53 23.3	15.041
11	20 6 23.16	2.4483	19 9 28.6	10.593	11	22 0 0.35	2.7925	8 38 19.2	15.095
12	20 8 49.95	2.4448	18 58 49.1	10.722	12	22 2 17.82	2.7899	8 23 11.9	15.148
13	20 11 16.54	2.4416	18 48 2.0	10.849	13	22 4 35.14	2.7875	8 8 1.4	15.200
14	20 13 42.94	2.4382	18 37 7.2	10.976	14	22 6 52.32	2.7851	7 52 47.9	15.249
15	20 16 9.12	2.4347	18 26 4.9	11.100	15	22 9 9.35	2.7827	7 37 31.5	15.297
16	20 18 35.10	2.4313	18 14 55.2	11.224	16	22 11 26.24	2.7803	7 22 12.3	15.343
17	20 21 0.88	2.4279	18 3 38.0	11.347	17	22 13 42.99	2.7780	7 6 50.4	15.387
18	20 23 26.45	2.4244	17 52 13.6	11.468	18	22 15 59.60	2.7758	6 51 25.9	15.429
19	20 25 51.81	2.4209	17 40 41.9	11.588	19	22 18 16.08	2.7737	6 35 58.9	15.470
20	20 28 16.96	2.4174	17 29 3.1	11.705	20	22 20 32.44	2.7715	6 20 29.5	15.509
21	20 30 41.90	2.4139	17 17 17.3	11.823	21	22 22 48.66	2.7694	6 4 57.8	15.546
22	20 33 6.63	2.4104	17 5 24.4	11.938	22	22 25 4.77	2.7674	5 49 24.0	15.581
23	20 35 31.15	2.4070	-16 53 24.7	+12.052	23	22 27 20.75	2.7653	-5 33 48.1	+15.614
MARCH 19.					MARCH 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 37 55.47	2.4035	-16 41 18.2	+12.164	0	22 29 36.61	2.7634	-5 18 10.3	+15.645
1	20 40 19.57	2.3999	16 29 5.0	12.275	1	22 31 52.36	2.7617	5 2 30.7	15.675
2	20 42 43.46	2.3965	16 16 45.2	12.385	2	22 34 8.01	2.7599	4 46 49.3	15.703
3	20 45 7.15	2.3930	16 4 18.8	12.493	3	22 36 23.55	2.7581	4 31 6.3	15.729
4	20 47 30.62	2.3895	15 51 46.0	12.600	4	22 38 38.98	2.7564	4 15 21.8	15.753
5	20 49 53.89	2.3860	15 39 6.8	12.705	5	22 40 54.32	2.7548	3 59 35.9	15.776
6	20 52 16.94	2.3825	15 26 21.4	12.808	6	22 43 9.56	2.7533	3 43 48.7	15.797
7	20 54 39.79	2.3791	15 13 29.8	12.910	7	22 45 24.71	2.7517	3 28 0.3	15.815
8	20 57 2.43	2.3757	15 0 32.2	13.010	8	22 47 39.76	2.7503	3 12 10.9	15.833
9	20 59 24.87	2.3722	14 47 28.6	13.109	9	22 49 54.74	2.7489	2 56 20.4	15.848
10	21 1 47.09	2.3688	14 34 19.1	13.208	10	22 52 9.63	2.7475	2 40 29.2	15.861
11	21 4 9.12	2.3654	14 21 3.7	13.303	11	22 54 24.44	2.7462	2 24 37.1	15.873
12	21 6 30.94	2.3620	14 7 42.8	13.396	12	22 56 39.17	2.7450	2 8 44.4	15.883
13	21 8 52.56	2.3587	13 54 16.2	13.488	13	22 58 53.84	2.7438	1 52 51.2	15.890
14	21 11 13.98	2.3553	13 40 44.2	13.579	14	23 1 8.43	2.7428	1 36 57.6	15.897
15	21 13 35.19	2.3519	13 27 6.7	13.668	15	23 3 22.97	2.7418	1 21 3.6	15.902
16	21 15 56.21	2.3487	13 13 24.0	13.756	16	23 5 37.44	2.7407	1 5 9.4	15.903
17	21 18 17.03	2.3454	12 59 36.0	13.843	17	23 7 51.85	2.7398	0 49 15.2	15.904
18	21 20 37.66	2.3422	12 45 42.9	13.928	18	23 10 6.21	2.7389	0 33 20.9	15.904
19	21 22 58.09	2.3389	12 31 44.9	14.003	19	23 12 20.52	2.7382	0 17 26.7	15.901
20	21 25 18.33	2.3358	12 17 41.9	14.089	20	23 14 34.79	2.7374	-0 1 32.8	15.897
21	21 27 38.38	2.3327	12 3 34.2	14.168	21	23 16 49.01	2.7366	+0 14 20.9	15.891
22	21 29 58.25	2.3295	11 49 21.7	14.247	22	23 19 3.18	2.7360	0 30 14.1	15.882
23	21 32 17.92	2.3263	11 35 4.6	14.322	23	23 21 17.33	2.7355	0 46 6.7	15.872
24	21 34 37.41	2.3233	-11 20 43.1	+14.395	24	23 23 31.44	2.7349	+1 1 58.7	+15.861

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 22.					MARCH 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 23 31.44	2.2349	+ 1 1 58.7	+15.861	0	1 11 12.40	2.2690	+12 57 47.1	+13.353
1	23 25 45.52	2.2345	1 17 50.0	15.847	1	1 13 28.59	2.2707	13 11 5.7	13.264
2	23 27 59.58	2.2341	1 33 40.3	15.832	2	1 15 44.88	2.2723	13 24 18.8	13.173
3	23 30 13.61	2.2338	1 49 29.8	15.815	3	1 18 1.27	2.2740	13 37 26.5	13.082
4	23 32 27.63	2.2334	2 5 18.1	15.798	4	1 20 17.76	2.2757	13 50 28.6	12.988
5	23 34 41.62	2.2332	2 21 5.3	15.776	5	1 22 34.35	2.2773	14 3 25.1	12.894
6	23 36 55.61	2.2331	2 36 51.2	15.754	6	1 24 51.04	2.2790	14 16 15.9	12.799
7	23 39 9.59	2.2329	2 52 35.8	15.731	7	1 27 7.83	2.2808	14 29 1.0	12.703
8	23 41 23.56	2.2328	3 8 18.9	15.705	8	1 29 24.73	2.2826	14 41 40.2	12.603
9	23 43 37.53	2.2328	3 24 0.4	15.678	9	1 31 41.74	2.2843	14 54 13.4	12.504
10	23 45 51.50	2.2329	3 39 40.2	15.648	10	1 33 58.85	2.2860	15 6 40.7	12.404
11	23 48 5.48	2.2330	3 55 18.2	15.618	11	1 36 16.06	2.2878	15 19 1.9	12.303
12	23 50 19.46	2.2331	4 10 54.3	15.585	12	1 38 33.38	2.2896	15 31 17.0	12.200
13	23 52 33.45	2.2333	4 26 28.4	15.551	13	1 40 50.81	2.2914	15 43 25.9	12.095
14	23 54 47.46	2.2337	4 42 0.4	15.515	14	1 43 8.35	2.2932	15 55 28.4	11.990
15	23 57 1.49	2.2339	4 57 30.2	15.478	15	1 45 25.99	2.2949	16 7 24.7	11.884
16	23 59 15.53	2.2343	5 12 57.7	15.438	16	1 47 43.74	2.2968	16 19 14.5	11.776
17	0 1 29.60	2.2348	5 28 22.8	15.398	17	1 50 1.60	2.2986	16 30 57.8	11.668
18	0 3 43.70	2.2353	5 43 45.4	15.355	18	1 52 19.57	2.3003	16 42 34.6	11.558
19	0 5 57.83	2.2358	5 59 5.4	15.311	19	1 54 37.64	2.3021	16 54 4.8	11.448
20	0 8 11.99	2.2363	6 14 22.7	15.266	20	1 56 55.82	2.3039	17 5 28.4	11.337
21	0 10 26.18	2.2369	6 29 37.3	15.218	21	1 59 14.11	2.3057	17 16 45.2	11.223
22	0 12 40.42	2.2377	6 44 48.9	15.168	22	2 1 32.50	2.3074	17 27 55.2	11.109
23	0 14 54.70	2.2383	+ 6 59 57.5	+15.118	23	2 3 51.00	2.3093	+17 38 58.3	+10.995
MARCH 23.					MARCH 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 17 9.01	2.2390	+ 7 15 3.1	+15.067	0	2 6 9.61	2.3110	+17 49 54.6	+10.579
1	0 19 23.38	2.2398	7 30 5.5	15.012	1	2 8 28.32	2.3127	18 0 43.8	10.703
2	0 21 37.79	2.2407	7 45 4.5	14.956	2	2 10 47.13	2.3144	18 11 26.1	10.645
3	0 23 52.26	2.2416	8 0 0.2	14.899	3	2 13 6.05	2.3162	18 22 1.2	10.525
4	0 26 6.78	2.2425	8 14 52.4	14.841	4	2 15 25.07	2.3178	18 32 29.1	10.406
5	0 28 21.36	2.2436	8 29 41.1	14.781	5	2 17 44.18	2.3194	18 42 49.9	10.287
6	0 30 36.01	2.2446	8 44 26.1	14.718	6	2 20 3.40	2.3212	18 53 3.5	10.165
7	0 32 50.71	2.2456	8 59 7.3	14.654	7	2 22 22.72	2.3228	19 3 9.7	10.042
8	0 35 5.48	2.2467	9 13 44.6	14.590	8	2 24 42.13	2.3243	19 13 8.5	9.919
9	0 37 20.31	2.2478	9 28 18.1	14.524	9	2 27 1.64	2.3260	19 23 0.0	9.796
10	0 39 35.22	2.2491	9 42 47.5	14.456	10	2 29 21.25	2.3276	19 32 44.0	9.671
11	0 41 50.20	2.2503	9 57 12.8	14.387	11	2 31 40.95	2.3291	19 42 20.5	9.546
12	0 44 5.25	2.2515	10 11 33.9	14.316	12	2 34 0.74	2.3306	19 51 49.5	9.420
13	0 46 20.38	2.2528	10 25 50.7	14.243	13	2 36 20.62	2.3321	20 1 10.9	9.293
14	0 48 35.59	2.2542	10 40 3.1	14.170	14	2 38 40.59	2.3335	20 10 24.6	9.164
15	0 50 50.88	2.2555	10 54 11.1	14.095	15	2 41 0.64	2.3349	20 19 30.6	9.037
16	0 53 6.25	2.2569	11 8 14.5	14.018	16	2 43 20.78	2.3363	20 28 29.0	8.908
17	0 55 21.71	2.2583	11 22 13.2	13.939	17	2 45 41.00	2.3377	20 37 19.5	8.778
18	0 57 37.25	2.2598	11 36 7.2	13.860	18	2 48 1.30	2.3390	20 46 2.3	8.648
19	0 59 52.88	2.2613	11 49 56.4	13.779	19	2 50 21.68	2.3403	20 54 37.2	8.516
20	1 2 8.60	2.2628	12 3 40.7	13.697	20	2 52 42.13	2.3414	21 3 4.2	8.384
21	1 4 24.41	2.2643	12 17 20.0	13.613	21	2 55 2.65	2.3427	21 11 23.3	8.253
22	1 6 40.32	2.2658	12 30 54.2	13.528	22	2 57 23.25	2.3438	21 19 34.5	8.119
23	1 8 56.31	2.2673	12 44 23.3	13.441	23	2 59 43.91	2.3449	21 27 37.6	7.985
24	1 11 12.40	2.2690	+12 57 47.1	+13.353	24	3 2 4.64	2.3460	+21 35 32.7	+7.851

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
MARCH 26.									MARCH 28.								
0	h	m	s	s	°	'	''		0	h	m	s	s	°	'	''	
1	3	2	4.64	2.3460	+21	35	32.7	+7.851	1	4	54	49.22	2.3265	+25	12	9.9	+1.146
2	3	4	25.43	2.3470	21	43	19.7	7.717	2	4	57	8.75	2.3244	25	13	14.5	1.008
3	3	6	46.28	2.3480	21	50	58.7	7.582	3	4	59	28.15	2.3223	25	14	10.9	0.872
4	3	9	7.19	2.3489	21	58	29.5	7.446	4	5	1	47.42	2.3201	25	14	59.1	0.734
5	3	11	28.15	2.3498	22	5	52.2	7.309	5	5	4	6.56	2.3178	25	15	39.0	0.597
6	3	13	49.16	2.3506	22	13	6.6	7.173	6	5	6	25.56	2.3155	25	16	10.7	0.461
7	3	16	10.22	2.3514	22	20	12.9	7.037	7	5	8	44.42	2.3131	25	16	34.3	0.325
8	3	18	31.33	2.3521	22	27	11.0	6.899	8	5	11	3.13	2.3107	25	16	49.7	0.189
9	3	20	52.47	2.3528	22	34	0.8	6.762	9	5	13	21.70	2.3082	25	16	57.0	+0.054
10	3	23	13.66	2.3533	22	40	42.4	6.623	10	5	15	40.11	2.3055	25	16	56.2	-0.080
11	3	25	34.87	2.3538	22	47	15.6	6.484	11	5	17	58.36	2.3029	25	16	47.4	0.214
12	3	27	56.12	2.3544	22	53	40.5	6.346	12	5	20	16.46	2.3002	25	16	30.5	0.348
13	3	30	17.40	2.3548	22	59	57.1	6.207	13	5	22	34.38	2.2973	25	16	5.6	0.482
14	3	32	38.70	2.3552	23	6	5.3	6.068	14	5	24	52.14	2.2946	25	15	32.7	0.614
15	3	35	0.02	2.3555	23	12	5.2	5.928	15	5	27	9.73	2.2917	25	14	51.9	0.746
16	3	37	21.36	2.3558	23	17	56.6	5.788	16	5	29	27.14	2.2887	25	14	3.2	0.878
17	3	39	42.71	2.3560	23	23	39.7	5.648	17	5	31	44.37	2.2857	25	13	6.6	1.009
18	3	42	4.06	2.3561	23	29	14.4	5.508	18	5	34	1.42	2.2827	25	12	2.1	1.140
19	3	44	25.44	2.3561	23	34	40.6	5.367	19	5	36	18.29	2.2796	25	10	49.8	1.270
20	3	46	46.81	2.3562	23	39	58.4	5.226	20	5	38	34.97	2.2768	25	9	29.7	1.399
21	3	49	8.18	2.3561	23	45	7.7	5.085	21	5	40	51.45	2.2731	25	8	1.9	1.528
22	3	51	29.54	2.3560	23	50	8.6	4.944	22	5	43	7.74	2.2699	25	6	26.3	1.657
23	3	53	50.90	2.3558	23	55	1.0	4.803	23	5	45	23.84	2.2666	25	4	43.1	1.784
24	3	56	12.24	2.3555	+23	59	44.9	+4.662	24	5	47	39.73	2.2632	+25	2	52.2	-1.912
MARCH 27.									MARCH 29.								
0	3	58	33.56	2.3552	+24	4	20.4	+4.521	0	5	49	55.42	2.2598	+25	0	53.7	-2.038
1	4	0	54.86	2.3548	24	8	47.4	4.378	1	5	52	10.90	2.2563	24	58	47.7	2.163
2	4	3	16.14	2.3543	24	13	5.8	4.237	2	5	54	26.18	2.2528	24	56	34.1	2.289
3	4	5	37.38	2.3538	24	17	15.8	4.095	3	5	56	41.24	2.2492	24	54	13.0	2.413
4	4	7	58.59	2.3533	24	21	17.2	3.953	4	5	58	56.08	2.2456	24	51	44.5	2.538
5	4	10	19.77	2.3526	24	25	10.2	3.813	5	6	1	10.71	2.2420	24	49	8.5	2.661
6	4	12	40.90	2.3518	24	28	54.7	3.671	6	6	3	25.12	2.2383	24	46	25.2	2.783
7	4	15	1.99	2.3510	24	32	30.7	3.528	7	6	5	39.31	2.2346	24	43	34.6	2.905
8	4	17	23.02	2.3501	24	35	58.1	3.387	8	6	7	53.27	2.2308	24	40	36.6	3.027
9	4	19	44.00	2.3492	24	39	17.1	3.247	9	6	10	7.00	2.2270	24	37	31.4	3.147
10	4	22	4.92	2.3482	24	42	27.7	3.105	10	6	12	20.51	2.2232	24	34	19.0	3.267
11	4	24	25.78	2.3470	24	45	29.7	2.963	11	6	14	33.78	2.2193	24	30	59.4	3.387
12	4	26	46.56	2.3458	24	48	23.3	2.823	12	6	16	46.83	2.2155	24	27	32.6	3.505
13	4	29	7.28	2.3447	24	51	8.4	2.682	13	6	18	59.64	2.2115	24	23	58.8	3.623
14	4	31	27.92	2.3433	24	53	45.1	2.541	14	6	21	12.21	2.2075	24	20	17.9	3.740
15	4	33	48.48	2.3420	24	56	13.3	2.400	15	6	23	24.54	2.2036	24	16	30.0	3.857
16	4	36	8.96	2.3405	24	58	33.1	2.260	16	6	25	36.64	2.1996	24	12	35.1	3.972
17	4	38	29.34	2.3390	25	0	44.5	2.120	17	6	27	48.49	2.1954	24	8	33.4	4.087
18	4	40	49.64	2.3375	25	2	47.5	1.980	18	6	30	0.09	2.1914	24	4	24.7	4.201
19	4	43	9.84	2.3358	25	4	42.1	1.840	19	6	32	11.46	2.1873	24	0	9.3	4.314
20	4	45	29.93	2.3340	25	6	28.3	1.701	20	6	34	22.57	2.1832	23	55	47.0	4.427
21	4	47	49.92	2.3323	25	8	6.2	1.563	21	6	36	33.44	2.1790	23	51	18.1	4.538
22	4	50	9.80	2.3304	25	9	35.8	1.423	22	6	38	44.05	2.1748	23	46	42.4	4.651
23	4	52	29.57	2.3285	25	10	57.0	1.284	23	6	40	54.42	2.1708	23	42	0.0	4.761
24	4	54	49.22	2.3265	+25	12	9.9	+1.146	24	6	43	4.54	2.1665	+23	37	11.1	-4.870

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 30.					APRIL 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 43 4.54	2.1665	+23 37 11.1	-4.870	0	8 22 11.47	1.9678	+17 51 38.7	-9.232
1	6 45 14.40	2.1623	23 32 15.6	4.979	1	8 24 9.43	1.9643	17 42 22.6	9.303
2	6 47 24.01	2.1581	23 27 13.6	5.088	2	8 26 7.18	1.9607	17 33 2.3	9.375
3	6 49 33.37	2.1538	23 22 5.1	5.196	3	8 28 4.71	1.9571	17 23 37.6	9.447
4	6 51 42.47	2.1496	23 16 50.2	5.302	4	8 30 2.03	1.9536	17 14 8.7	9.516
5	6 53 51.32	2.1453	23 11 28.9	5.408	5	8 31 59.14	1.9500	17 4 35.7	9.585
6	6 55 59.90	2.1409	23 6 1.2	5.513	6	8 33 56.03	1.9466	16 54 58.5	9.654
7	6 58 8.23	2.1368	23 0 27.3	5.617	7	8 35 52.73	1.9432	16 45 17.2	9.723
8	7 0 16.31	2.1324	22 54 47.2	5.721	8	8 37 49.21	1.9398	16 35 31.8	9.790
9	7 2 24.12	2.1281	22 49 0.8	5.824	9	8 39 45.50	1.9364	16 25 42.4	9.856
10	7 4 31.68	2.1238	22 43 8.3	5.926	10	8 41 41.58	1.9331	16 15 49.1	9.921
11	7 6 38.98	2.1195	22 37 9.7	6.027	11	8 43 37.47	1.9298	16 5 51.9	9.987
12	7 8 46.02	2.1152	22 31 5.1	6.127	12	8 45 33.16	1.9266	15 55 50.7	10.051
13	7 10 52.80	2.1109	22 24 54.5	6.228	13	8 47 28.66	1.9234	15 45 45.8	10.114
14	7 12 59.33	2.1066	22 18 37.8	6.327	14	8 49 23.97	1.9203	15 35 37.0	10.178
15	7 15 5.59	2.1023	22 12 15.3	6.424	15	8 51 19.10	1.9173	15 25 24.5	10.239
16	7 17 11.60	2.0979	22 5 46.9	6.522	16	8 53 14.04	1.9141	15 15 8.3	10.300
17	7 19 17.34	2.0936	21 59 12.7	6.618	17	8 55 8.79	1.9111	15 4 48.5	10.361
18	7 21 22.83	2.0894	21 52 32.7	6.714	18	8 57 3.37	1.9082	14 54 25.0	10.422
19	7 23 28.07	2.0851	21 45 47.0	6.809	19	8 58 57.77	1.9053	14 43 57.9	10.481
20	7 25 33.04	2.0808	21 38 55.6	6.903	20	9 0 52.00	1.9024	14 33 27.3	10.540
21	7 27 37.76	2.0765	21 31 58.6	6.997	21	9 2 46.06	1.8996	14 22 53.1	10.598
22	7 29 42.22	2.0722	21 24 56.0	7.090	22	9 4 39.95	1.8968	14 12 15.6	10.654
23	7 31 46.42	2.0679	+21 17 47.8	-7.182	23	9 6 33.67	1.8939	+14 1 34.6	-10.712
MARCH 31.					APRIL 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 33 50.37	2.0638	+21 10 34.2	-7.273	0	9 8 27.22	1.8913	+13 50 50.2	-10.768
1	7 35 54.07	2.0595	21 3 15.1	7.363	1	9 10 20.62	1.8887	13 40 2.5	10.823
2	7 37 57.51	2.0553	20 55 50.6	7.453	2	9 12 13.86	1.8861	13 29 11.5	10.877
3	7 40 0.70	2.0511	20 48 20.8	7.542	3	9 14 6.95	1.8835	13 18 17.3	10.931
4	7 42 3.64	2.0469	20 40 45.6	7.630	4	9 15 59.88	1.8810	13 7 19.8	10.984
5	7 44 6.33	2.0428	20 33 5.2	7.718	5	9 17 52.67	1.8786	12 56 19.2	11.036
6	7 46 8.77	2.0386	20 25 19.5	7.804	6	9 19 45.31	1.8762	12 45 15.5	11.088
7	7 48 10.96	2.0344	20 17 28.7	7.889	7	9 21 37.81	1.8738	12 34 8.6	11.139
8	7 50 12.90	2.0303	20 9 32.8	7.974	8	9 23 30.16	1.8714	12 22 56.8	11.189
9	7 52 14.59	2.0262	20 1 31.8	8.058	9	9 25 22.38	1.8693	12 11 45.9	11.240
10	7 54 16.04	2.0222	19 53 25.8	8.142	10	9 27 14.47	1.8670	12 0 30.0	11.288
11	7 56 17.25	2.0181	19 45 14.8	8.224	11	9 29 6.42	1.8648	11 49 11.3	11.337
12	7 58 18.21	2.0140	19 36 58.9	8.306	12	9 30 58.25	1.8628	11 37 49.6	11.385
13	8 0 18.93	2.0101	19 28 38.1	8.388	13	9 32 49.95	1.8608	11 26 25.1	11.432
14	8 2 19.42	2.0062	19 20 12.4	8.468	14	9 34 41.54	1.8588	11 14 57.8	11.478
15	8 4 19.67	2.0022	19 11 41.9	8.548	15	9 36 33.00	1.8568	11 3 27.8	11.523
16	8 6 19.68	1.9982	19 3 6.7	8.627	16	9 38 24.35	1.8548	10 51 55.0	11.568
17	8 8 19.45	1.9943	18 54 26.7	8.705	17	9 40 15.58	1.8530	10 40 19.6	11.613
18	8 10 19.00	1.9905	18 45 42.1	8.783	18	9 42 6.71	1.8513	10 28 41.5	11.657
19	8 12 18.31	1.9866	18 36 52.8	8.859	19	9 43 57.73	1.8495	10 17 0.8	11.699
20	8 14 17.39	1.9828	18 27 59.0	8.935	20	9 45 48.65	1.8478	10 5 17.6	11.741
21	8 16 16.25	1.9791	18 19 0.6	9.011	21	9 47 39.47	1.8462	9 53 31.9	11.783
22	8 18 14.88	1.9753	18 9 57.7	9.085	22	9 49 30.19	1.8446	9 41 43.6	11.824
23	8 20 13.29	1.9716	18 0 50.4	9.158	23	9 51 20.82	1.8431	9 29 53.0	11.864
24	8 22 11.47	1.9678	+17 51 38.7	-9.232	24	9 53 11.36	1.8416	+ 9 17 59.9	-11.904

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 3.					APRIL 5.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 53 11.36	1.8416	+9 17 59.9	-11.904	0	11 20 58.82	1.8333	- 0 45 57.0	-12.986
1	9 55 1.81	1.8403	9 6 4.5	11.943	1	11 22 49.19	1.8403	0 58 56.3	12.991
2	9 56 52.19	1.8389	8 54 6.7	11.982	2	11 24 39.65	1.8418	1 11 55.9	12.995
3	9 58 42.48	1.8375	8 42 6.7	12.019	3	11 26 30.20	1.8432	1 24 55.7	12.998
4	10 0 32.69	1.8363	8 30 4.4	12.056	4	11 28 20.83	1.8448	1 37 55.6	13.000
5	10 2 22.84	1.8352	8 18 0.0	12.092	5	11 30 11.57	1.8464	1 50 55.7	13.002
6	10 4 12.91	1.8340	8 5 53.4	12.128	6	11 32 2.40	1.8481	2 3 55.8	13.001
7	10 6 2.92	1.8329	7 53 44.7	12.163	7	11 33 53.34	1.8499	2 16 55.8	13.001
8	10 7 52.86	1.8319	7 41 33.9	12.198	8	11 35 44.39	1.8518	2 29 55.9	13.000
9	10 9 42.75	1.8309	7 29 21.0	12.231	9	11 37 35.55	1.8536	2 42 55.8	12.998
10	10 11 32.57	1.8300	7 17 6.2	12.263	10	11 39 26.82	1.8555	2 55 55.7	12.996
11	10 13 22.35	1.8292	7 4 49.5	12.296	11	11 41 18.21	1.8575	3 8 55.3	12.991
12	10 15 12.07	1.8283	6 52 30.8	12.327	12	11 43 9.72	1.8596	3 21 54.6	12.987
13	10 17 1.75	1.8277	6 40 10.3	12.358	13	11 45 1.36	1.8617	3 34 53.7	12.982
14	10 18 51.39	1.8270	6 27 47.9	12.388	14	11 46 53.12	1.8638	3 47 52.4	12.976
15	10 20 40.99	1.8263	6 15 23.7	12.418	15	11 48 45.02	1.8662	4 0 50.8	12.969
16	10 22 30.55	1.8258	6 2 57.8	12.446	16	11 50 37.06	1.8684	4 13 48.7	12.961
17	10 24 20.08	1.8253	5 50 30.2	12.473	17	11 52 29.23	1.8708	4 26 46.1	12.952
18	10 26 9.58	1.8248	5 38 1.0	12.501	18	11 54 21.55	1.8733	4 39 42.9	12.943
19	10 27 59.06	1.8245	5 25 30.1	12.528	19	11 56 14.02	1.8757	4 52 39.2	12.932
20	10 29 48.52	1.8241	5 12 57.7	12.553	20	11 58 6.63	1.8783	5 5 34.7	12.920
21	10 31 37.95	1.8238	5 0 23.7	12.579	21	11 59 59.40	1.8808	5 18 29.6	12.908
22	10 33 27.37	1.8236	4 47 48.2	12.603	22	12 1 52.33	1.8835	5 31 23.7	12.896
23	10 35 16.78	1.8235	+4 35 11.3	-12.627	23	12 3 45.42	1.8863	- 5 44 17.0	-12.881
APRIL 4.					APRIL 6.				
0	10 37 6.19	1.8234	+4 22 33.0	-12.650	0	12 5 38.68	1.8890	- 5 57 9.4	-12.866
1	10 38 55.59	1.8233	4 9 53.3	12.673	1	12 7 32.10	1.8918	6 10 0.9	12.860
2	10 40 44.99	1.8233	3 57 12.3	12.694	2	12 9 25.70	1.8948	6 22 51.4	12.853
3	10 42 34.39	1.8234	3 44 30.0	12.716	3	12 11 19.47	1.8977	6 35 40.8	12.845
4	10 44 23.80	1.8236	3 31 46.4	12.736	4	12 13 13.42	1.9008	6 48 29.2	12.797
5	10 46 13.22	1.8238	3 19 1.7	12.755	5	12 15 7.56	1.9038	7 1 16.4	12.777
6	10 48 2.65	1.8240	3 6 15.8	12.774	6	12 17 1.88	1.9068	7 14 2.4	12.756
7	10 49 52.10	1.8244	2 53 28.8	12.793	7	12 18 56.38	1.9101	7 26 47.1	12.734
8	10 51 41.58	1.8248	2 40 40.7	12.810	8	12 20 51.09	1.9134	7 39 30.5	12.712
9	10 53 31.07	1.8251	2 27 51.6	12.826	9	12 22 45.99	1.9166	7 52 12.5	12.688
10	10 55 20.59	1.8256	2 15 1.6	12.842	10	12 24 41.06	1.9200	8 4 53.1	12.664
11	10 57 10.14	1.8262	2 2 10.6	12.858	11	12 26 36.39	1.9235	8 17 32.2	12.639
12	10 58 59.73	1.8268	1 49 18.7	12.872	12	12 28 31.90	1.9269	8 30 9.8	12.613
13	11 0 49.36	1.8275	1 36 26.0	12.886	13	12 30 27.62	1.9304	8 42 45.7	12.584
14	11 2 39.93	1.8282	1 23 32.4	12.899	14	12 32 23.55	1.9340	8 55 19.9	12.556
15	11 4 28.74	1.8289	1 10 38.1	12.911	15	12 34 19.70	1.9377	9 7 52.4	12.527
16	11 6 18.50	1.8298	0 57 43.1	12.922	16	12 36 16.07	1.9414	9 20 23.1	12.497
17	11 8 8.32	1.8306	0 44 47.5	12.933	17	12 38 12.67	1.9452	9 32 52.0	12.465
18	11 9 58.19	1.8318	0 31 51.2	12.943	18	12 40 9.49	1.9489	9 45 18.9	12.433
19	11 11 48.13	1.8328	0 18 54.3	12.953	19	12 42 6.54	1.9528	9 57 43.9	12.399
20	11 13 38.13	1.8338	+0 5 56.9	12.961	20	12 44 3.82	1.9568	10 10 6.8	12.364
21	11 15 28.19	1.8350	-0 7 1.0	12.968	21	12 46 1.35	1.9606	10 22 27.6	12.328
22	11 17 18.33	1.8363	0 19 59.3	12.975	22	12 47 59.11	1.9647	10 34 46.2	12.292
23	11 19 8.54	1.8374	0 32 58.0	12.981	23	12 49 57.11	1.9688	10 47 2.6	12.255
24	11 20 58.82	1.8388	-0 45 57.0	-12.986	24	12 51 55.36	1.9729	-10 59 16.8	-12.217

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 7.					APRIL 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 51 55.36	1.9729	-10 59 16.8	-12.217	0	14 32 12.37	2.2180	-19 39 25.0	-8.998
1	12 53 53.86	1.9771	11 11 28.6	12.176	1	14 34 25.62	2.2237	19 48 22.0	8.901
2	12 55 52.61	1.9813	11 23 37.9	12.135	2	14 36 39.21	2.2293	19 57 13.1	8.803
3	12 57 51.61	1.9856	11 35 44.8	12.093	3	14 38 53.13	2.2348	20 5 58.3	8.703
4	12 59 50.88	1.9899	11 47 49.1	12.050	4	14 41 7.39	2.2406	20 14 37.5	8.603
5	13 1 50.40	1.9943	11 59 50.8	12.006	5	14 43 22.00	2.2463	20 23 10.6	8.500
6	13 3 50.19	1.9988	12 11 49.8	11.960	6	14 45 36.94	2.2518	20 31 37.5	8.398
7	13 5 50.25	2.0033	12 23 46.0	11.914	7	14 47 52.22	2.2575	20 39 58.3	8.293
8	13 7 50.58	2.0078	12 35 39.5	11.867	8	14 50 7.84	2.2631	20 48 12.7	8.187
9	13 9 51.18	2.0123	12 47 30.0	11.818	9	14 52 23.79	2.2687	20 56 20.7	8.080
10	13 11 52.06	2.0169	12 59 17.6	11.768	10	14 54 40.08	2.2743	21 4 22.3	7.973
11	13 13 53.21	2.0216	13 11 2.2	11.718	11	14 56 56.70	2.2798	21 12 17.4	7.863
12	13 15 54.65	2.0263	13 22 43.7	11.666	12	14 59 13.65	2.2853	21 20 5.9	7.753
13	13 17 56.37	2.0311	13 34 22.1	11.613	13	15 1 30.94	2.2909	21 27 47.7	7.641
14	13 19 58.38	2.0359	13 45 57.2	11.558	14	15 3 48.56	2.2964	21 35 22.8	7.528
15	13 22 0.68	2.0407	13 57 29.0	11.503	15	15 6 6.51	2.3018	21 42 51.1	7.414
16	13 24 3.26	2.0456	14 8 57.5	11.446	16	15 8 24.78	2.3073	21 50 12.5	7.298
17	13 26 6.15	2.0506	14 20 22.5	11.388	17	15 10 43.38	2.3128	21 57 26.9	7.182
18	13 28 9.33	2.0555	14 31 44.1	11.329	18	15 13 2.31	2.3182	22 4 34.3	7.064
19	13 30 12.81	2.0605	14 43 2.0	11.269	19	15 15 21.56	2.3234	22 11 34.6	6.945
20	13 32 16.59	2.0655	14 54 16.4	11.208	20	15 17 41.12	2.3288	22 18 27.7	6.825
21	13 34 20.67	2.0706	15 5 27.0	11.145	21	15 20 1.01	2.3341	22 25 13.6	6.704
22	13 36 25.06	2.0758	15 16 33.8	11.082	22	15 22 21.21	2.3393	22 31 52.2	6.582
23	13 38 29.76	2.0809	-15 27 36.8	-11.018	23	15 24 41.72	2.3444	-22 38 23.4	-6.458
APRIL 8.					APRIL 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 40 34.77	2.0861	-15 38 35.9	-10.952	0	15 27 2.54	2.3496	-22 44 47.1	-6.333
1	13 42 40.09	2.0913	15 49 31.0	10.884	1	15 29 23.67	2.3548	22 51 3.4	6.208
2	13 44 45.73	2.0966	16 0 22.0	10.815	2	15 31 45.11	2.3598	22 57 12.0	6.081
3	13 46 51.68	2.1018	16 11 8.8	10.746	3	15 34 6.85	2.3648	23 3 13.1	5.953
4	13 48 57.95	2.1072	16 21 51.5	10.675	4	15 36 28.89	2.3698	23 9 6.4	5.824
5	13 51 4.54	2.1125	16 32 29.8	10.603	5	15 38 51.22	2.3747	23 14 52.0	5.694
6	13 53 11.45	2.1179	16 43 3.8	10.529	6	15 41 13.85	2.3796	23 20 29.7	5.563
7	13 55 18.69	2.1233	16 53 33.3	10.455	7	15 43 36.77	2.3843	23 25 59.5	5.431
8	13 57 26.25	2.1288	17 3 58.4	10.379	8	15 45 59.97	2.3891	23 31 21.4	5.298
9	13 59 34.14	2.1342	17 14 18.8	10.303	9	15 48 23.46	2.3938	23 36 35.2	5.163
10	14 1 42.35	2.1396	17 24 34.7	10.224	10	15 50 47.23	2.3984	23 41 40.9	5.028
11	14 3 50.89	2.1452	17 34 45.7	10.144	11	15 53 11.27	2.4029	23 46 38.6	4.893
12	14 5 59.77	2.1507	17 44 52.0	10.064	12	15 55 35.58	2.4074	23 51 28.0	4.754
13	14 8 8.97	2.1562	17 54 53.4	9.982	13	15 58 0.16	2.4118	23 56 9.1	4.617
14	14 10 18.51	2.1618	18 4 49.8	9.898	14	16 0 25.00	2.4162	24 0 42.0	4.478
15	14 12 28.38	2.1673	18 14 41.2	9.814	15	16 2 50.10	2.4204	24 5 6.4	4.337
16	14 14 38.59	2.1729	18 24 27.5	9.728	16	16 5 15.45	2.4246	24 9 22.4	4.197
17	14 16 49.13	2.1784	18 34 8.6	9.641	17	16 7 41.05	2.4288	24 13 30.0	4.055
18	14 19 0.00	2.1841	18 43 44.4	9.553	18	16 10 6.90	2.4328	24 17 29.0	3.912
19	14 21 11.22	2.1898	18 53 15.0	9.464	19	16 12 32.99	2.4368	24 21 19.4	3.768
20	14 23 22.77	2.1953	19 2 40.1	9.373	20	16 14 59.31	2.4406	24 25 1.1	3.623
21	14 25 34.66	2.2010	19 11 59.7	9.281	21	16 17 25.86	2.4443	24 28 34.2	3.478
22	14 27 46.89	2.2067	19 21 13.8	9.188	22	16 19 52.63	2.4481	24 31 58.5	3.333
23	14 29 59.46	2.2123	19 30 22.2	9.093	23	16 22 19.63	2.4518	24 35 14.1	3.186
24	14 32 12.37	2.2180	-19 39 25.0	-8.998	24	16 24 46.84	2.4553	-24 38 20.8	-3.038

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 11.					APRIL 13.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	16 24 46.84	2.4653	-24 38 20.8	-3.088	0	18 24 45.67	2.5029	-24 5 12.5	+ 4.480
1	16 27 14.26	2.4657	24 41 18.6	2.589	1	18 27 15.80	2.5014	24 0 39.1	4.635
2	16 29 41.88	2.4630	24 44 7.5	2.741	2	18 29 45.84	2.4998	23 55 56.3	4.790
3	16 32 9.70	2.4653	24 46 47.5	2.591	3	18 32 15.77	2.4980	23 51 4.3	4.943
4	16 34 37.71	2.4684	24 49 18.4	2.440	4	18 34 45.60	2.4963	23 46 3.1	5.097
5	16 37 5.91	2.4715	24 51 40.3	2.289	5	18 37 15.32	2.4943	23 40 52.7	5.251
6	16 39 34.29	2.4744	24 53 53.1	2.138	6	18 39 44.92	2.4923	23 35 33.0	5.408
7	16 42 2.84	2.4773	24 55 56.8	1.985	7	18 42 14.39	2.4902	23 30 4.3	5.554
8	16 44 31.56	2.4801	24 57 51.3	1.833	8	18 44 43.74	2.4881	23 24 26.5	5.705
9	16 47 0.45	2.4828	24 59 36.7	1.679	9	18 47 12.96	2.4858	23 18 39.6	5.857
10	16 49 29.49	2.4853	25 1 12.8	1.524	10	18 49 42.04	2.4835	23 12 43.7	6.007
11	16 51 58.68	2.4878	25 2 39.6	1.370	11	18 52 10.98	2.4811	23 6 38.8	6.156
12	16 54 28.02	2.4902	25 3 57.2	1.215	12	18 54 39.77	2.4786	23 0 25.0	6.304
13	16 56 57.50	2.4924	25 5 5.4	1.059	13	18 57 8.41	2.4761	22 54 2.3	6.453
14	16 59 27.11	2.4945	25 6 4.3	0.904	14	18 59 36.90	2.4735	22 47 30.7	6.600
15	17 1 56.84	2.4965	25 6 53.9	0.748	15	19 2 5.23	2.4708	22 40 50.3	6.746
16	17 4 26.69	2.4985	25 7 34.0	0.590	16	19 4 33.40	2.4681	22 34 1.2	6.891
17	17 6 56.66	2.5008	25 8 4.7	0.433	17	19 7 1.40	2.4653	22 27 3.4	7.036
18	17 9 26.73	2.5030	25 8 26.0	0.276	18	19 9 29.23	2.4624	22 19 56.9	7.180
19	17 11 56.90	2.5056	25 8 37.8	-0.118	19	19 11 56.89	2.4595	22 12 41.8	7.323
20	17 14 27.16	2.5082	25 8 40.1	+0.040	20	19 14 24.37	2.4565	22 5 18.2	7.464
21	17 16 57.52	2.5006	25 8 33.0	0.198	21	19 16 51.67	2.4534	21 57 46.1	7.606
22	17 19 27.95	2.5078	25 8 16.3	0.353	22	19 19 18.78	2.4508	21 50 5.5	7.747
23	17 21 58.45	2.5099	-25 7 50.1	+0.516	23	19 21 45.71	2.4473	-21 42 16.5	+ 7.886
APRIL 12.					APRIL 14.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	17 24 29.02	2.5100	-25 7 14.4	+0.675	0	19 24 12.45	2.4440	-21 34 19.2	+ 5.024
1	17 26 59.65	2.5109	25 6 29.1	0.833	1	19 26 38.99	2.4408	21 26 13.6	5.182
2	17 29 30.33	2.5118	25 5 34.4	0.993	2	19 29 5.34	2.4375	21 17 59.8	5.338
3	17 32 1.06	2.5126	25 4 30.0	1.153	3	19 31 31.49	2.4342	21 9 37.9	5.493
4	17 34 31.83	2.5131	25 3 16.1	1.312	4	19 33 57.44	2.4308	21 1 7.9	5.648
5	17 37 2.63	2.5136	25 1 52.6	1.472	5	19 36 23.19	2.4274	20 52 29.8	5.701
6	17 39 33.46	2.5140	25 0 19.5	1.632	6	19 38 48.73	2.4239	20 43 43.8	5.853
7	17 42 4.31	2.5143	24 58 36.8	1.791	7	19 41 14.06	2.4204	20 34 49.8	5.965
8	17 44 35.18	2.5145	24 56 44.6	1.951	8	19 43 39.18	2.4169	20 25 48.0	6.095
9	17 47 6.05	2.5145	24 54 42.7	2.111	9	19 46 4.09	2.4134	20 16 38.4	6.225
10	17 49 36.92	2.5145	24 52 31.3	2.270	10	19 48 28.79	2.4099	20 7 21.0	6.353
11	17 52 7.79	2.5144	24 50 10.3	2.430	11	19 50 53.28	2.4063	19 57 56.0	6.480
12	17 54 38.65	2.5142	24 47 39.7	2.589	12	19 53 17.55	2.4027	19 48 23.4	6.606
13	17 57 9.49	2.5138	24 44 59.6	2.748	13	19 55 41.60	2.3990	19 38 43.3	6.730
14	17 59 40.30	2.5133	24 42 10.0	2.906	14	19 58 5.43	2.3954	19 28 55.8	6.854
15	18 2 11.08	2.5127	24 39 10.9	3.065	15	20 0 29.05	2.3918	19 19 0.8	6.977
16	18 4 41.82	2.5120	24 36 2.2	3.223	16	20 2 52.44	2.3880	19 8 58.6	7.098
17	18 7 12.52	2.5113	24 32 44.1	3.382	17	20 5 15.61	2.3843	18 58 49.1	7.218
18	18 9 43.17	2.5108	24 29 16.4	3.540	18	20 7 38.55	2.3806	18 48 32.5	7.336
19	18 12 13.76	2.5098	24 25 39.3	3.697	19	20 10 1.28	2.3769	18 38 8.8	7.453
20	18 14 44.29	2.5088	24 21 52.8	3.854	20	20 12 23.78	2.3731	18 27 38.1	7.570
21	18 17 14.75	2.5071	24 17 56.8	4.012	21	20 14 46.05	2.3694	18 17 0.4	7.686
22	18 19 45.14	2.5058	24 13 51.4	4.168	22	20 17 8.11	2.3658	18 6 15.8	7.799
23	18 22 15.45	2.5044	24 9 36.7	4.324	23	20 19 29.94	2.3619	17 55 24.5	7.912
24	18 24 45.67	2.5029	-24 5 12.5	+4.480	24	20 21 51.54	2.3582	-17 44 26.4	+11.023

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 15.					APRIL 17.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	20 21 51.54	2.3582	-17 44 26.4	+11.023	0	22 11 10.10	2.2111	-7 12 48.3	+14.748
1	20 24 12.92	2.3545	17 33 21.7	11.133	1	22 13 22.71	2.2092	6 58 2.2	14.789
2	20 26 34.08	2.3508	17 22 10.4	11.242	2	22 15 35.20	2.2073	6 43 13.6	14.829
3	20 28 55.02	2.3471	17 10 52.7	11.349	3	22 17 47.58	2.2055	6 28 22.7	14.868
4	20 31 15.73	2.3433	16 59 28.5	11.456	4	22 19 59.86	2.2038	6 13 29.4	14.906
5	20 33 36.22	2.3397	16 47 58.0	11.561	5	22 22 12.03	2.2021	5 58 34.0	14.941
6	20 35 56.49	2.3360	16 36 21.2	11.664	6	22 24 24.11	2.2005	5 43 36.5	14.976
7	20 38 16.54	2.3323	16 24 38.3	11.767	7	22 26 36.09	2.1989	5 28 36.9	15.008
8	20 40 36.36	2.3286	16 12 49.2	11.868	8	22 28 47.98	2.1974	5 13 35.5	15.039
9	20 42 55.97	2.3251	16 0 54.2	11.967	9	22 30 59.78	2.1959	4 58 32.2	15.069
10	20 45 15.37	2.3214	15 48 53.2	12.066	10	22 33 11.49	2.1946	4 43 27.2	15.098
11	20 47 34.54	2.3177	15 36 46.3	12.163	11	22 35 23.13	2.1933	4 28 20.5	15.124
12	20 49 53.49	2.3142	15 24 33.7	12.258	12	22 37 34.69	2.1921	4 13 12.3	15.149
13	20 52 12.24	2.3107	15 12 15.4	12.352	13	22 39 46.18	2.1910	3 58 2.6	15.173
14	20 54 30.77	2.3071	14 59 51.5	12.444	14	22 41 57.61	2.1898	3 42 51.6	15.194
15	20 56 49.09	2.3036	14 47 22.1	12.536	15	22 44 8.96	2.1888	3 27 39.3	15.215
16	20 59 7.20	2.3002	14 34 47.2	12.627	16	22 46 20.26	2.1878	3 12 25.8	15.234
17	21 1 25.11	2.2968	14 22 6.9	12.715	17	22 48 31.50	2.1869	2 57 11.2	15.252
18	21 3 42.81	2.2933	14 9 21.4	12.802	18	22 50 42.69	2.1861	2 41 55.6	15.268
19	21 6 0.31	2.2899	13 56 30.7	12.888	19	22 52 53.83	2.1853	2 26 39.1	15.282
20	21 8 17.60	2.2865	13 43 34.9	12.973	20	22 55 4.92	2.1846	2 11 21.8	15.294
21	21 10 34.69	2.2833	13 30 34.0	13.056	21	22 57 15.98	2.1839	1 56 3.8	15.306
22	21 12 51.59	2.2800	13 17 28.2	13.137	22	22 59 26.99	2.1833	1 40 45.1	15.316
23	21 15 8.29	2.2767	-13 4 17.6	+13.218	23	23 1 37.97	2.1828	-1 25 25.9	+15.322
APRIL 16.					APRIL 18.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	21 17 24.79	2.2735	-12 51 2.1	+13.297	0	23 3 48.93	2.1824	-1 10 6.3	+15.330
1	21 19 41.11	2.2703	12 37 42.0	13.373	1	23 5 59.86	2.1819	0 54 46.3	15.335
2	21 21 57.23	2.2672	12 24 17.3	13.449	2	23 8 10.76	2.1816	0 39 26.1	15.338
3	21 24 13.17	2.2642	12 10 48.1	13.523	3	23 10 21.65	2.1814	0 24 5.8	15.340
4	21 26 28.93	2.2612	11 57 14.5	13.597	4	23 12 32.53	2.1812	-0 8 45.3	15.341
5	21 28 44.51	2.2582	11 43 36.5	13.668	5	23 14 43.39	2.1810	+0 6 35.1	15.339
6	21 30 59.91	2.2553	11 29 54.3	13.738	6	23 16 54.25	2.1810	0 21 55.4	15.337
7	21 33 15.14	2.2523	11 16 7.9	13.807	7	23 19 5.11	2.1809	0 37 15.5	15.332
8	21 35 30.19	2.2494	11 2 17.5	13.874	8	23 21 15.96	2.1810	0 52 35.2	15.326
9	21 37 45.07	2.2467	10 48 23.0	13.940	9	23 23 26.83	2.1812	1 7 54.6	15.319
10	21 39 59.79	2.2439	10 34 24.7	14.004	10	23 25 37.70	2.1813	1 23 13.5	15.310
11	21 42 14.34	2.2413	10 20 22.5	14.068	11	23 27 48.58	2.1815	1 38 31.8	15.299
12	21 44 28.74	2.2386	10 6 16.6	14.128	12	23 29 59.48	2.1818	1 53 49.4	15.288
13	21 46 42.97	2.2359	9 52 7.1	14.188	13	23 32 10.40	2.1823	2 9 6.3	15.274
14	21 48 57.05	2.2334	9 37 54.1	14.246	14	23 34 21.35	2.1827	2 24 22.3	15.258
15	21 51 10.98	2.2310	9 23 37.6	14.303	15	23 36 32.32	2.1831	2 39 37.3	15.242
16	21 53 24.77	2.2285	9 9 17.7	14.358	16	23 38 43.32	2.1837	2 54 51.3	15.224
17	21 55 38.40	2.2261	8 54 54.6	14.413	17	23 40 54.36	2.1843	3 10 4.2	15.204
18	21 57 51.90	2.2238	8 40 28.2	14.465	18	23 43 5.44	2.1860	3 25 15.8	15.183
19	22 0 5.26	2.2215	8 25 58.8	14.515	19	23 45 16.56	2.1858	3 40 26.1	15.159
20	22 2 18.48	2.2193	8 11 26.4	14.565	20	23 47 27.73	2.1865	3 55 34.9	15.135
21	22 4 31.57	2.2172	7 56 51.0	14.613	21	23 49 38.94	2.1873	4 10 42.3	15.109
22	22 6 44.54	2.2151	7 42 12.8	14.659	22	23 51 50.21	2.1883	4 25 48.0	15.081
23	22 8 57.38	2.2130	7 27 31.9	14.704	23	23 54 1.54	2.1893	4 40 52.0	15.053
24	22 11 10.10	2.2111	-7 12 48.3	+14.748	24	23 56 12.92	2.1903	+4 55 54.3	+15.023

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 19.					APRIL 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 56 12.92	2.1903	+ 4 55 54.3	+15.023	0	1 43 24.59	2.2891	+15 53 0.9	+11.803
1	23 58 24.37	2.1913	5 10 54.7	14.989	1	1 45 42.02	2.2918	16 4 46.1	11.703
2	0 0 35.88	2.1924	5 25 53.0	14.955	2	1 47 59.60	2.2943	16 16 25.2	11.600
3	0 2 47.46	2.1937	5 40 49.3	14.920	3	1 50 17.34	2.2969	16 27 58.1	11.497
4	0 4 59.12	2.1949	5 55 43.4	14.883	4	1 52 35.23	2.2996	16 39 24.8	11.393
5	0 7 10.85	2.1962	6 10 35.3	14.846	5	1 54 53.29	2.3023	16 50 45.2	11.287
6	0 9 22.66	2.1976	6 25 24.9	14.806	6	1 57 11.50	2.3048	17 1 59.2	11.180
7	0 11 34.56	2.1990	6 40 11.9	14.763	7	1 59 29.86	2.3073	17 13 6.8	11.072
8	0 13 46.54	2.2003	6 54 56.5	14.721	8	2 1 48.38	2.3100	17 24 7.8	10.963
9	0 15 58.60	2.2018	7 9 38.4	14.677	9	2 4 7.06	2.3126	17 35 2.3	10.853
10	0 18 10.76	2.2035	7 24 17.7	14.631	10	2 6 25.89	2.3151	17 45 50.1	10.741
11	0 20 23.02	2.2051	7 38 54.1	14.583	11	2 8 44.87	2.3176	17 56 31.2	10.628
12	0 22 35.37	2.2067	7 53 27.6	14.533	12	2 11 4.00	2.3201	18 7 5.5	10.514
13	0 24 47.82	2.2084	8 7 58.1	14.483	13	2 13 23.28	2.3227	18 17 32.9	10.400
14	0 27 0.38	2.2102	8 22 25.6	14.432	14	2 15 42.72	2.3252	18 27 53.5	10.284
15	0 29 13.04	2.2119	8 36 49.9	14.378	15	2 18 2.30	2.3276	18 38 7.0	10.167
16	0 31 25.81	2.2138	8 51 10.9	14.323	16	2 20 22.03	2.3300	18 48 13.5	10.049
17	0 33 38.69	2.2157	9 5 28.6	14.267	17	2 22 41.90	2.3323	18 58 12.9	9.930
18	0 35 51.69	2.2176	9 19 42.9	14.208	18	2 25 1.91	2.3348	19 8 5.1	9.810
19	0 38 4.80	2.2195	9 33 53.6	14.148	19	2 27 22.07	2.3372	19 17 50.1	9.689
20	0 40 18.03	2.2216	9 48 0.7	14.088	20	2 29 42.37	2.3395	19 27 27.8	9.568
21	0 42 31.39	2.2236	10 2 4.1	14.025	21	2 32 2.81	2.3418	19 36 58.2	9.445
22	0 44 44.86	2.2257	10 16 3.7	13.961	22	2 34 23.38	2.3439	19 46 21.2	9.321
23	0 46 58.47	2.2278	+10 29 59.4	+13.895	23	2 36 44.08	2.3462	+19 55 36.7	+ 9.196
APRIL 20.					APRIL 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 49 12.20	2.2299	+10 43 51.1	+13.828	0	2 39 4.92	2.3484	+20 4 44.7	+ 9.070
1	0 51 26.06	2.2321	10 57 38.8	13.760	1	2 41 25.89	2.3505	20 13 45.1	8.944
2	0 53 40.05	2.2343	11 11 22.3	13.690	2	2 43 46.98	2.3526	20 22 38.0	8.817
3	0 55 54.18	2.2367	11 25 1.6	13.619	3	2 46 8.20	2.3547	20 31 23.1	8.688
4	0 58 8.45	2.2389	11 38 36.6	13.547	4	2 48 29.54	2.3567	20 40 0.6	8.560
5	1 0 22.85	2.2412	11 52 7.2	13.473	5	2 50 51.00	2.3587	20 48 30.3	8.430
6	1 2 37.39	2.2436	12 5 33.3	13.398	6	2 53 12.58	2.3605	20 56 52.2	8.299
7	1 4 52.08	2.2459	12 18 54.9	13.320	7	2 55 34.26	2.3623	21 5 6.2	8.168
8	1 7 6.90	2.2483	12 32 11.7	13.242	8	2 57 56.06	2.3642	21 13 12.3	8.036
9	1 9 21.87	2.2508	12 45 23.9	13.163	9	3 0 17.96	2.3659	21 21 10.5	7.903
10	1 11 36.99	2.2533	12 58 31.2	13.081	10	3 2 39.97	2.3676	21 29 0.7	7.770
11	1 13 52.26	2.2557	13 11 33.6	12.998	11	3 5 2.07	2.3692	21 36 42.9	7.636
12	1 16 7.67	2.2582	13 24 31.0	12.914	12	3 7 24.27	2.3708	21 44 17.0	7.501
13	1 18 23.24	2.2607	13 37 23.3	12.829	13	3 9 46.57	2.3724	21 51 43.0	7.366
14	1 20 38.95	2.2632	13 50 10.5	12.743	14	3 12 8.96	2.3738	21 59 0.9	7.229
15	1 22 54.82	2.2658	14 2 52.4	12.654	15	3 14 31.43	2.3753	22 6 10.5	7.093
16	1 25 10.84	2.2683	14 15 29.0	12.565	16	3 16 53.99	2.3766	22 13 12.0	6.956
17	1 27 27.02	2.2709	14 28 0.2	12.475	17	3 19 16.62	2.3778	22 20 5.2	6.818
18	1 29 43.35	2.2734	14 40 26.0	12.383	18	3 21 39.33	2.3791	22 26 50.1	6.679
19	1 31 59.83	2.2760	14 52 46.1	12.289	19	3 24 2.11	2.3802	22 33 26.7	6.541
20	1 34 16.47	2.2787	15 5 0.7	12.195	20	3 26 24.95	2.3813	22 39 55.0	6.402
21	1 36 33.27	2.2813	15 17 9.5	12.098	21	3 28 47.86	2.3823	22 46 14.9	6.262
22	1 38 50.22	2.2838	15 29 12.5	12.002	22	3 31 10.82	2.3832	22 52 26.4	6.121
23	1 41 7.33	2.2864	15 41 9.7	11.903	23	3 33 33.84	2.3840	22 58 29.4	5.981
24	1 43 24.59	2.2891	+15 53 0.9	+11.803	24	3 35 56.90	2.3848	+23 4 24.1	+ 5.840

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 23.					APRIL 25.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	3 35 56.90	2.3848	+23 4 24.1	+5.840	0	5 29 46.03	2.3256	+24 59 54.8	-0.973
1	3 38 20.01	2.3855	23 10 10.2	5.698	1	5 32 5.47	2.3224	24 58 52.4	1.107
2	3 40 43.16	2.3862	23 15 47.9	5.557	2	5 34 24.72	2.3192	24 57 42.0	1.243
3	3 43 6.35	2.3868	23 21 17.0	5.414	3	5 36 43.77	2.3158	24 56 23.4	1.374
4	3 45 29.57	2.3872	23 26 37.6	5.272	4	5 39 2.62	2.3124	24 54 57.1	1.505
5	3 47 52.81	2.3875	23 31 49.6	5.129	5	5 41 21.26	2.3090	24 53 22.8	1.638
6	3 50 16.07	2.3878	23 36 53.1	4.987	6	5 43 39.70	2.3055	24 51 40.5	1.771
7	3 52 39.35	2.3882	23 41 48.0	4.843	7	5 45 57.92	2.3018	24 49 50.3	1.901
8	3 55 2.65	2.3883	23 46 34.2	4.699	8	5 48 15.92	2.2982	24 47 52.4	2.031
9	3 57 25.95	2.3883	23 51 11.9	4.556	9	5 50 33.70	2.2945	24 45 46.6	2.161
10	3 59 49.25	2.3883	23 55 40.9	4.412	10	5 52 51.26	2.2908	24 43 33.1	2.289
11	4 2 12.55	2.3883	24 0 1.3	4.268	11	5 55 8.60	2.2870	24 41 11.9	2.418
12	4 4 35.84	2.3881	24 4 13.1	4.124	12	5 57 25.70	2.2831	24 38 43.0	2.545
13	4 6 59.12	2.3878	24 8 16.2	3.980	13	5 59 42.57	2.2792	24 36 6.5	2.671
14	4 9 22.38	2.3875	24 12 10.7	3.835	14	6 1 59.20	2.2752	24 33 22.5	2.797
15	4 11 45.62	2.3871	24 15 56.4	3.691	15	6 4 15.59	2.2712	24 30 30.9	2.922
16	4 14 8.83	2.3865	24 19 33.6	3.547	16	6 6 31.74	2.2671	24 27 31.9	3.046
17	4 16 32.00	2.3859	24 23 2.0	3.402	17	6 8 47.64	2.2629	24 24 25.4	3.170
18	4 18 55.14	2.3853	24 26 21.8	3.258	18	6 11 3.29	2.2588	24 21 11.5	3.293
19	4 21 18.23	2.3845	24 29 32.9	3.113	19	6 13 18.69	2.2546	24 17 50.3	3.415
20	4 23 41.28	2.3837	24 32 35.4	2.969	20	6 15 33.84	2.2503	24 14 21.7	3.537
21	4 26 4.27	2.3827	24 35 29.2	2.825	21	6 17 48.73	2.2461	24 10 45.9	3.657
22	4 28 27.20	2.3817	24 38 14.4	2.681	22	6 20 3.37	2.2418	24 7 2.9	3.776
23	4 30 50.07	2.3806	+24 40 50.9	+2.537	23	6 22 17.74	2.2373	+24 3 12.8	-3.896
APRIL 24.					APRIL 26.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	4 33 12.87	2.3793	+24 43 18.8	+2.393	0	6 24 31.85	2.2329	+23 59 15.5	-4.013
1	4 35 35.59	2.3781	24 45 38.0	2.248	1	6 26 45.69	2.2285	23 55 11.2	4.130
2	4 37 58.24	2.3768	24 47 48.6	2.105	2	6 28 59.27	2.2241	23 50 59.9	4.247
3	4 40 20.80	2.3752	24 49 50.6	1.962	3	6 31 12.58	2.2195	23 46 41.6	4.363
4	4 42 43.26	2.3737	24 51 44.0	1.819	4	6 33 25.61	2.2150	23 42 16.4	4.478
5	4 45 5.64	2.3721	24 53 28.9	1.676	5	6 35 38.38	2.2105	23 37 44.3	4.592
6	4 47 27.91	2.3703	24 55 5.1	1.533	6	6 37 50.87	2.2058	23 33 5.4	4.704
7	4 49 50.08	2.3685	24 56 32.8	1.391	7	6 40 3.08	2.2013	23 28 19.8	4.816
8	4 52 12.13	2.3666	24 57 52.0	1.248	8	6 42 15.02	2.1966	23 23 27.5	4.928
9	4 54 34.07	2.3647	24 59 2.6	1.106	9	6 44 26.67	2.1919	23 18 28.5	5.038
10	4 56 55.89	2.3627	25 0 4.7	0.965	10	6 46 38.05	2.1873	23 13 22.9	5.148
11	4 59 17.59	2.3605	25 0 58.4	0.823	11	6 48 49.15	2.1826	23 8 10.7	5.258
12	5 1 39.15	2.3583	25 1 43.5	0.682	12	6 50 59.96	2.1778	23 2 52.0	5.368
13	5 4 0.58	2.3560	25 2 20.2	0.542	13	6 53 10.49	2.1732	22 57 26.9	5.472
14	5 6 21.87	2.3536	25 2 48.5	0.403	14	6 55 20.74	2.1685	22 51 55.4	5.578
15	5 8 43.01	2.3512	25 3 8.5	0.263	15	6 57 30.71	2.1638	22 46 17.5	5.683
16	5 11 4.01	2.3487	25 3 20.0	+0.123	16	6 59 40.39	2.1589	22 40 33.4	5.788
17	5 13 24.85	2.3460	25 3 23.2	-0.015	17	7 1 49.78	2.1542	22 34 43.0	5.892
18	5 15 45.53	2.3433	25 3 18.2	0.153	18	7 3 58.89	2.1494	22 28 46.4	5.995
19	5 18 6.05	2.3406	25 3 4.8	0.292	19	7 6 7.71	2.1447	22 22 43.6	6.097
20	5 20 26.40	2.3378	25 2 43.2	0.429	20	7 8 16.25	2.1399	22 16 34.8	6.198
21	5 22 46.58	2.3348	25 2 13.3	0.566	21	7 10 24.50	2.1351	22 10 19.9	6.298
22	5 25 6.58	2.3318	25 1 35.3	0.702	22	7 12 32.46	2.1303	22 3 59.1	6.397
23	5 27 26.40	2.3288	25 0 49.1	0.838	23	7 14 40.14	2.1255	21 57 32.3	6.495
24	5 29 46.03	2.3256	+24 59 54.8	-0.973	24	7 16 47.52	2.1207	+21 50 59.7	-6.593

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 27.					APRIL 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 16 47.52	2.1207	+21 50 59.7	-6.593	0	8 53 24.53	1.9168	+14 58 14.8	-10.206
1	7 18 54.62	2.1159	21 44 21.2	6.689	1	8 55 19.43	1.9133	14 47 55.3	10.353
2	7 21 1.43	2.1112	21 37 37.0	6.785	2	8 57 14.13	1.9101	14 37 32.4	10.410
3	7 23 7.96	2.1064	21 30 47.0	6.880	3	8 59 8.64	1.9069	14 27 6.1	10.467
4	7 25 14.20	2.1017	21 23 51.4	6.973	4	9 1 2.96	1.9037	14 16 36.4	10.523
5	7 27 20.16	2.0969	21 16 50.2	7.068	5	9 2 57.08	1.9005	14 6 3.3	10.579
6	7 29 25.83	2.0921	21 9 43.3	7.160	6	9 4 51.02	1.8975	13 55 26.9	10.633
7	7 31 31.21	2.0874	21 2 31.0	7.251	7	9 6 44.78	1.8945	13 44 47.3	10.687
8	7 33 36.32	2.0827	20 55 13.2	7.342	8	9 8 38.36	1.8915	13 34 4.5	10.740
9	7 35 41.14	2.0779	20 47 50.0	7.432	9	9 10 31.76	1.8886	13 23 18.5	10.793
10	7 37 45.67	2.0733	20 40 21.4	7.521	10	9 12 24.99	1.8857	13 12 29.4	10.845
11	7 39 49.93	2.0687	20 32 47.5	7.608	11	9 14 18.04	1.8826	13 1 37.1	10.896
12	7 41 53.91	2.0640	20 25 8.4	7.695	12	9 16 10.93	1.8802	12 50 41.9	10.946
13	7 43 57.61	2.0593	20 17 24.1	7.782	13	9 18 3.66	1.8775	12 39 43.6	10.996
14	7 46 1.03	2.0548	20 9 34.6	7.868	14	9 19 56.23	1.8748	12 28 42.4	11.044
15	7 48 4.18	2.0502	20 1 40.0	7.952	15	9 21 48.64	1.8722	12 17 38.3	11.093
16	7 50 7.05	2.0456	19 53 40.4	8.036	16	9 23 40.89	1.8697	12 6 31.2	11.141
17	7 52 9.64	2.0410	19 45 35.7	8.119	17	9 25 33.00	1.8673	11 55 21.4	11.188
18	7 54 11.97	2.0365	19 37 26.1	8.201	18	9 27 24.96	1.8648	11 44 8.7	11.235
19	7 56 14.02	2.0319	19 29 11.6	8.283	19	9 29 16.77	1.8624	11 32 53.2	11.280
20	7 58 15.80	2.0275	19 20 52.2	8.363	20	9 31 8.45	1.8602	11 21 35.1	11.326
21	8 0 17.32	2.0231	19 12 28.1	8.443	21	9 32 59.99	1.8579	11 10 14.2	11.370
22	8 2 18.57	2.0186	19 3 59.1	8.522	22	9 34 51.40	1.8557	10 58 50.7	11.413
23	8 4 19.55	2.0142	+18 55 25.5	-8.606	23	9 36 42.67	1.8535	+10 47 24.6	-11.457
APRIL 28.					APRIL 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 6 20.27	2.0098	+18 46 47.3	-8.676	0	9 38 33.82	1.8515	+10 35 55.9	-11.499
1	8 8 20.73	2.0056	18 38 4.4	8.753	1	9 40 24.85	1.8495	10 24 24.7	11.541
2	8 10 20.94	2.0013	18 29 16.9	8.828	2	9 42 15.76	1.8475	10 12 51.0	11.583
3	8 12 20.88	1.9970	18 20 25.0	8.903	3	9 44 6.55	1.8456	10 1 14.8	11.623
4	8 14 20.58	1.9928	18 11 28.5	8.978	4	9 45 57.23	1.8438	9 49 36.3	11.663
5	8 16 20.02	1.9886	18 2 27.7	9.050	5	9 47 47.80	1.8420	9 37 55.3	11.703
6	8 18 19.21	1.9844	17 53 22.5	9.123	6	9 49 38.27	1.8403	9 26 12.0	11.741
7	8 20 18.15	1.9803	17 44 12.9	9.195	7	9 51 28.64	1.8387	9 14 26.4	11.778
8	8 22 16.84	1.9763	17 34 59.1	9.265	8	9 53 18.91	1.8370	9 2 38.6	11.816
9	8 24 15.30	1.9723	17 25 41.1	9.335	9	9 55 9.08	1.8355	8 50 48.5	11.853
10	8 26 13.51	1.9683	17 16 18.9	9.405	10	9 56 59.17	1.8341	8 38 56.2	11.889
11	8 28 11.48	1.9642	17 6 52.5	9.473	11	9 58 49.17	1.8326	8 27 1.8	11.924
12	8 30 9.21	1.9603	16 57 22.1	9.541	12	10 0 39.08	1.8313	8 15 5.3	11.960
13	8 32 6.71	1.9564	16 47 47.6	9.608	13	10 2 28.92	1.8300	8 3 6.7	11.993
14	8 34 3.98	1.9526	16 38 9.2	9.673	14	10 4 18.68	1.8288	7 51 6.1	12.027
15	8 36 1.02	1.9488	16 28 26.8	9.740	15	10 6 8.37	1.8277	7 39 3.5	12.060
16	8 37 57.84	1.9451	16 18 40.4	9.804	16	10 7 58.00	1.8266	7 26 59.0	12.092
17	8 39 54.43	1.9413	16 8 50.3	9.868	17	10 9 47.56	1.8255	7 14 52.5	12.124
18	8 41 50.80	1.9377	15 58 56.3	9.932	18	10 11 37.06	1.8245	7 2 44.1	12.155
19	8 43 46.95	1.9340	15 48 58.5	9.994	19	10 13 26.50	1.8236	6 50 33.9	12.185
20	8 45 42.88	1.9305	15 38 57.0	10.065	20	10 15 15.89	1.8228	6 38 21.9	12.215
21	8 47 38.61	1.9270	15 28 51.9	10.116	21	10 17 5.24	1.8220	6 26 8.1	12.244
22	8 49 34.12	1.9234	15 18 43.1	10.177	22	10 18 54.53	1.8213	6 13 52.6	12.272
23	8 51 29.42	1.9201	15 8 30.7	10.236	23	10 20 43.79	1.8207	6 1 35.5	12.299
24	8 53 24.53	1.9168	+14 58 14.8	-10.206	24	10 22 33.01	1.8201	+ 5 49 16.7	-12.327

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 1.					MAY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 22 33.01	1.8201	+5 49 16.7	-12.327	0	11 50 28.13	1.8687	- 4 21 15.8	-12.842
1	10 24 22.20	1.8195	5 36 56.3	12.354	1	11 52 20.33	1.8713	4 34 6.1	12.834
2	10 26 11.35	1.8190	5 24 34.2	12.380	2	11 54 12.69	1.8741	4 46 55.9	12.826
3	10 28 0.48	1.8187	5 12 10.7	12.405	3	11 56 5.22	1.8769	4 59 45.2	12.818
4	10 29 49.59	1.8183	4 59 45.6	12.430	4	11 57 57.92	1.8797	5 12 34.0	12.808
5	10 31 38.68	1.8180	4 47 19.1	12.454	5	11 59 50.78	1.8826	5 25 22.1	12.796
6	10 33 27.75	1.8178	4 34 51.1	12.478	6	12 1 43.83	1.8856	5 38 9.5	12.785
7	10 35 16.81	1.8177	4 22 21.8	12.500	7	12 3 37.05	1.8886	5 50 56.3	12.773
8	10 37 5.87	1.8176	4 9 51.1	12.523	8	12 5 30.46	1.8918	6 3 42.2	12.759
9	10 38 54.92	1.8175	3 57 19.1	12.543	9	12 7 24.06	1.8949	6 16 27.4	12.745
10	10 40 43.97	1.8176	3 44 45.9	12.564	10	12 9 17.85	1.8981	6 29 11.6	12.729
11	10 42 33.03	1.8178	3 32 11.4	12.585	11	12 11 11.83	1.9014	6 41 54.9	12.714
12	10 44 22.10	1.8179	3 19 35.7	12.604	12	12 13 6.02	1.9048	6 54 37.3	12.698
13	10 46 11.18	1.8182	3 6 58.9	12.623	13	12 15 0.41	1.9083	7 7 18.6	12.679
14	10 48 0.28	1.8186	2 54 20.9	12.642	14	12 16 55.01	1.9118	7 19 58.8	12.660
15	10 49 49.41	1.8189	2 41 41.9	12.658	15	12 18 49.82	1.9153	7 32 37.8	12.640
16	10 51 38.55	1.8193	2 29 1.9	12.676	16	12 20 44.84	1.9189	7 45 15.6	12.620
17	10 53 27.73	1.8198	2 16 20.8	12.693	17	12 22 40.09	1.9227	7 57 52.2	12.598
18	10 55 16.93	1.8204	2 3 38.8	12.708	18	12 24 35.56	1.9263	8 10 27.4	12.575
19	10 57 6.18	1.8211	1 50 55.9	12.723	19	12 26 31.25	1.9302	8 23 1.2	12.552
20	10 58 55.46	1.8218	1 38 12.1	12.737	20	12 28 27.18	1.9340	8 35 33.6	12.528
21	11 0 44.79	1.8226	1 25 27.5	12.750	21	12 30 23.33	1.9379	8 48 4.5	12.503
22	11 2 34.17	1.8234	1 12 42.1	12.763	22	12 32 19.73	1.9420	9 0 33.8	12.475
23	11 4 23.60	1.8243	+0 59 55.9	-12.775	23	12 34 16.37	1.9460	- 9 13 1.5	-12.448
MAY 2.					MAY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 6 13.08	1.8253	+0 47 9.1	-12.786	0	12 36 13.25	1.9501	- 9 25 27.6	-12.420
1	11 8 2.63	1.8263	0 34 21.6	12.798	1	12 38 10.38	1.9543	9 37 51.9	12.390
2	11 9 52.24	1.8274	0 21 33.4	12.808	2	12 40 7.77	1.9587	9 50 14.4	12.359
3	11 11 41.92	1.8286	+0 8 44.7	12.817	3	12 42 5.42	1.9630	10 2 35.0	12.328
4	11 13 31.67	1.8298	-0 4 4.6	12.826	4	12 44 3.32	1.9673	10 14 53.7	12.295
5	11 15 21.50	1.8312	0 16 54.4	12.834	5	12 46 1.49	1.9717	10 27 10.4	12.262
6	11 17 11.41	1.8326	0 29 44.7	12.841	6	12 47 59.92	1.9762	10 39 25.1	12.227
7	11 19 1.41	1.8340	0 42 35.3	12.847	7	12 49 58.63	1.9808	10 51 37.6	12.191
8	11 20 51.49	1.8354	0 55 26.3	12.853	8	12 51 57.61	1.9853	11 3 48.0	12.154
9	11 22 41.66	1.8371	1 8 17.7	12.858	9	12 53 56.86	1.9899	11 15 56.1	12.116
10	11 24 31.94	1.8388	1 21 9.3	12.863	10	12 55 56.40	1.9947	11 28 1.9	12.078
11	11 26 22.31	1.8404	1 34 1.2	12.866	11	12 57 56.22	1.9994	11 40 5.4	12.038
12	11 28 12.79	1.8423	1 46 53.2	12.868	12	12 59 56.33	2.0043	11 52 6.4	11.996
13	11 30 3.38	1.8440	1 59 45.4	12.870	13	13 1 56.73	2.0092	12 4 4.9	11.953
14	11 31 54.07	1.8459	2 12 37.6	12.872	14	13 3 57.43	2.0141	12 16 0.8	11.909
15	11 33 44.89	1.8480	2 25 30.0	12.873	15	13 5 58.42	2.0190	12 27 54.0	11.865
16	11 35 35.83	1.8500	2 38 22.3	12.872	16	13 7 59.71	2.0241	12 39 44.6	11.819
17	11 37 26.89	1.8521	2 51 14.6	12.872	17	13 10 1.31	2.0292	12 51 32.3	11.772
18	11 39 18.08	1.8543	3 4 6.9	12.869	18	13 12 3.21	2.0343	13 3 17.2	11.724
19	11 41 9.40	1.8565	3 16 58.9	12.866	19	13 14 5.43	2.0396	13 14 59.2	11.675
20	11 43 0.86	1.8588	3 29 50.8	12.863	20	13 16 7.96	2.0448	13 26 38.2	11.624
21	11 44 52.45	1.8612	3 42 42.5	12.860	21	13 18 10.80	2.0501	13 38 14.1	11.572
22	11 46 44.20	1.8637	3 55 34.0	12.855	22	13 20 13.97	2.0554	13 49 46.8	11.519
23	11 48 36.09	1.8661	4 8 25.1	12.848	23	13 22 17.45	2.0608	14 1 16.4	11.466
24	11 50 28.13	1.8687	-4 21 15.8	-12.842	24	13 24 21.26	2.0663	-14 12 42.7	-11.410

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 5.					MAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 24 21.26	2.0663	-14 12 42.7	-11.410	0	15 10 21.76	2.3547	-21 51 59.5	-7.209
1	13 26 25.40	2.0717	14 24 5.6	11.353	1	15 12 43.22	2.3606	21 59 8.5	7.089
2	13 28 29.86	2.0772	14 35 25.1	11.296	2	15 15 5.03	2.3664	22 6 10.2	6.967
3	13 30 34.66	2.0828	14 46 41.1	11.237	3	15 17 27.19	2.3722	22 13 4.5	6.843
4	13 32 39.80	2.0884	14 57 53.5	11.177	4	15 19 49.69	2.3778	22 19 51.4	6.719
5	13 34 45.27	2.0940	15 9 2.3	11.115	5	15 22 12.63	2.3836	22 26 30.8	6.593
6	13 36 51.08	2.0998	15 20 7.3	11.052	6	15 24 35.72	2.3892	22 33 2.6	6.466
7	13 38 57.24	2.1055	15 31 8.5	10.988	7	15 26 59.23	2.3948	22 39 26.7	6.338
8	13 41 3.74	2.1112	15 42 5.8	10.923	8	15 29 23.09	2.4003	22 45 43.1	6.208
9	13 43 10.58	2.1170	15 52 59.2	10.857	9	15 31 47.27	2.4057	22 51 51.7	6.078
10	13 45 17.78	2.1229	16 3 48.6	10.788	10	15 34 11.77	2.4111	22 57 52.4	5.946
11	13 47 25.33	2.1287	16 14 33.8	10.718	11	15 36 36.60	2.4164	23 3 45.2	5.813
12	13 49 33.22	2.1346	16 25 14.8	10.648	12	15 39 1.74	2.4217	23 9 29.9	5.678
13	13 51 41.48	2.1406	16 35 51.6	10.577	13	15 41 27.20	2.4269	23 15 6.5	5.543
14	13 53 50.09	2.1465	16 46 24.0	10.503	14	15 43 52.97	2.4321	23 20 35.0	5.407
15	13 55 59.06	2.1525	16 56 52.0	10.429	15	15 46 19.05	2.4372	23 25 55.3	5.268
16	13 58 8.39	2.1586	17 7 15.5	10.353	16	15 48 45.43	2.4421	23 31 7.2	5.129
17	14 0 18.09	2.1646	17 17 84.4	10.277	17	15 51 12.10	2.4470	23 36 10.8	4.990
18	14 2 28.14	2.1707	17 27 48.7	10.198	18	15 53 39.07	2.4518	23 41 5.9	4.848
19	14 4 38.57	2.1768	17 37 58.2	10.118	19	15 56 6.32	2.4565	23 45 52.6	4.707
20	14 6 49.35	2.1828	17 48 2.8	10.037	20	15 58 33.85	2.4612	23 50 30.7	4.563
21	14 9 0.51	2.1890	17 58 2.6	9.954	21	16 1 1.66	2.4658	23 55 0.1	4.418
22	14 11 12.03	2.1951	18 7 57.3	9.870	22	16 3 29.74	2.4702	23 59 20.9	4.273
23	14 13 23.92	2.2013	-18 17 47.0	-9.785	23	16 5 58.08	2.4745	-24 3 32.9	-4.128
MAY 6.					MAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 15 36.18	2.2074	-18 27 31.5	-9.698	0	16 8 26.68	2.4788	-24 7 36.2	-3.961
1	14 17 48.81	2.2137	18 37 10.8	9.611	1	16 10 55.54	2.4831	24 11 30.6	3.832
2	14 20 1.82	2.2198	18 46 44.8	9.521	2	16 13 24.65	2.4872	24 15 16.0	3.698
3	14 22 15.19	2.2260	18 56 13.3	9.430	3	16 15 54.00	2.4912	24 18 52.5	3.553
4	14 24 28.94	2.2323	19 5 36.4	9.338	4	16 18 23.59	2.4950	24 22 19.9	3.382
5	14 26 43.07	2.2385	19 14 53.9	9.245	5	16 20 53.40	2.4988	24 25 38.3	3.230
6	14 28 57.56	2.2447	19 24 5.8	9.150	6	16 23 23.44	2.5025	24 28 47.5	3.078
7	14 31 12.43	2.2509	19 33 11.9	9.053	7	16 25 53.70	2.5061	24 31 47.6	2.924
8	14 33 27.67	2.2571	19 42 12.2	8.956	8	16 28 24.17	2.5096	24 34 38.4	2.769
9	14 35 43.28	2.2633	19 51 6.6	8.857	9	16 30 54.84	2.5129	24 37 19.9	2.615
10	14 37 59.27	2.2695	19 59 55.0	8.757	10	16 33 25.72	2.5162	24 39 52.2	2.460
11	14 40 15.62	2.2757	20 8 37.4	8.655	11	16 35 56.78	2.5198	24 42 15.1	2.308
12	14 42 32.35	2.2819	20 17 13.6	8.552	12	16 38 28.03	2.5223	24 44 28.5	2.146
13	14 44 49.45	2.2882	20 25 43.6	8.448	13	16 40 59.46	2.5252	24 46 32.6	1.988
14	14 47 6.93	2.2943	20 34 7.3	8.342	14	16 43 31.05	2.5279	24 48 27.1	1.830
15	14 49 24.77	2.3004	20 42 24.6	8.235	15	16 46 2.81	2.5306	24 50 12.2	1.672
16	14 51 42.98	2.3066	20 50 35.5	8.127	16	16 48 34.72	2.5331	24 51 47.7	1.512
17	14 54 1.56	2.3128	20 58 39.8	8.016	17	16 51 6.78	2.5355	24 53 13.6	1.353
18	14 56 20.51	2.3188	21 6 37.4	7.905	18	16 53 38.98	2.5378	24 54 30.0	1.192
19	14 58 39.82	2.3248	21 14 28.4	7.793	19	16 56 11.31	2.5399	24 55 36.6	1.031
20	15 0 59.49	2.3308	21 22 12.5	7.678	20	16 58 43.77	2.5419	24 56 33.7	0.870
21	15 3 19.52	2.3368	21 29 49.8	7.563	21	17 1 16.34	2.5438	24 57 21.0	0.708
22	15 5 39.91	2.3428	21 37 20.1	7.447	22	17 3 49.03	2.5457	24 57 58.6	0.545
23	15 8 0.66	2.3488	21 44 43.4	7.328	23	17 6 21.82	2.5473	24 58 26.4	0.383
24	15 10 21.78	2.3547	-21 51 59.5	-7.209	24	17 8 54.70	2.5488	-24 58 44.5	-0.220

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 9.					MAY 11.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	17 8 54.70	2.5488	-24 58 44.5	-0.220	0	19 10 38.26	2.4803	-22 3 14.0	+7.361
1	17 11 27.67	2.5503	24 58 52.8	-0.057	1	19 13 6.97	2.4765	21 55 48.1	7.502
2	17 14 0.73	2.5515	24 58 51.3	+0.107	2	19 15 35.44	2.4727	21 48 13.8	7.642
3	17 16 33.85	2.5526	24 58 40.0	0.270	3	19 18 3.69	2.4688	21 40 31.1	7.781
4	17 19 7.04	2.5536	24 58 18.9	0.433	4	19 20 31.69	2.4648	21 32 40.1	7.919
5	17 21 40.28	2.5545	24 57 48.0	0.598	5	19 22 59.46	2.4608	21 24 40.8	8.056
6	17 24 13.58	2.5553	24 57 7.2	0.762	6	19 25 26.98	2.4567	21 16 33.4	8.192
7	17 26 46.91	2.5558	24 56 16.6	0.926	7	19 27 54.26	2.4526	21 8 17.8	8.327
8	17 29 20.28	2.5563	24 55 16.1	1.090	8	19 30 21.29	2.4483	20 59 54.2	8.460
9	17 31 53.67	2.5567	24 54 5.8	1.254	9	19 32 48.06	2.4441	20 51 22.6	8.593
10	17 34 27.08	2.5569	24 52 45.6	1.418	10	19 35 14.58	2.4399	20 42 43.1	8.724
11	17 37 0.50	2.5570	24 51 15.6	1.583	11	19 37 40.85	2.4356	20 33 55.7	8.854
12	17 39 33.92	2.5569	24 49 35.7	1.747	12	19 40 6.85	2.4313	20 25 0.6	8.983
13	17 42 7.33	2.5568	24 47 46.0	1.911	13	19 42 32.60	2.4269	20 15 57.8	9.110
14	17 44 40.74	2.5565	24 45 46.4	2.075	14	19 44 58.08	2.4225	20 6 47.4	9.236
15	17 47 14.11	2.5561	24 43 37.0	2.239	15	19 47 23.90	2.4181	19 57 29.5	9.361
16	17 49 47.47	2.5556	24 41 17.7	2.403	16	19 49 48.25	2.4137	19 48 4.1	9.484
17	17 52 20.78	2.5548	24 38 48.7	2.565	17	19 52 12.94	2.4092	19 38 31.4	9.607
18	17 54 54.05	2.5541	24 36 9.9	2.729	18	19 54 37.35	2.4047	19 28 51.3	9.728
19	17 57 27.27	2.5532	24 33 21.2	2.892	19	19 57 1.50	2.4003	19 19 4.0	9.848
20	18 0 0.43	2.5521	24 30 22.9	3.054	20	19 59 25.38	2.3957	19 9 9.6	9.966
21	18 2 33.52	2.5510	24 27 14.7	3.217	21	20 1 48.98	2.3911	18 59 8.1	10.083
22	18 5 6.55	2.5498	24 23 56.9	3.378	22	20 4 12.31	2.3865	18 48 59.6	10.199
23	18 7 39.49	2.5488	-24 20 29.4	+3.540	23	20 6 35.36	2.3819	-18 38 44.2	+10.313
MAY 10.					MAY 12.				
0	18 10 12.35	2.5468	-24 16 52.1	+3.701	0	20 8 58.14	2.3774	-18 28 22.0	+10.426
1	18 12 45.11	2.5452	24 13 5.3	3.861	1	20 11 20.65	2.3728	18 17 53.1	10.538
2	18 15 17.77	2.5434	24 9 8.8	4.021	2	20 13 42.88	2.3683	18 7 17.4	10.648
3	18 17 50.32	2.5416	24 5 2.8	4.180	3	20 16 4.84	2.3637	17 56 35.3	10.757
4	18 20 22.76	2.5397	24 0 47.2	4.339	4	20 18 26.52	2.3591	17 45 46.6	10.865
5	18 22 55.08	2.5376	23 56 22.1	4.498	5	20 20 47.93	2.3546	17 34 51.5	10.971
6	18 25 27.27	2.5354	23 51 47.5	4.655	6	20 23 9.07	2.3500	17 23 50.1	11.076
7	18 27 59.33	2.5331	23 47 3.5	4.812	7	20 25 29.93	2.3454	17 12 42.4	11.179
8	18 30 31.24	2.5308	23 42 10.1	4.968	8	20 27 50.52	2.3409	17 1 28.6	11.281
9	18 33 3.02	2.5283	23 37 7.3	5.124	9	20 30 10.84	2.3363	16 50 8.7	11.382
10	18 35 34.64	2.5257	23 31 55.2	5.279	10	20 32 30.88	2.3318	16 38 42.8	11.482
11	18 38 6.10	2.5229	23 26 33.8	5.434	11	20 34 50.65	2.3273	16 27 10.9	11.579
12	18 40 37.39	2.5202	23 21 3.1	5.588	12	20 37 10.16	2.3229	16 15 33.3	11.675
13	18 43 8.52	2.5173	23 15 23.3	5.740	13	20 39 29.40	2.3184	16 3 49.9	11.770
14	18 45 39.47	2.5143	23 9 34.3	5.892	14	20 41 48.37	2.3139	15 52 0.9	11.863
15	18 48 10.24	2.5113	23 3 36.3	6.043	15	20 44 7.07	2.3095	15 40 6.3	11.956
16	18 50 40.82	2.5082	22 57 29.2	6.193	16	20 46 25.51	2.3052	15 28 6.2	12.047
17	18 53 11.22	2.5050	22 51 13.2	6.342	17	20 48 43.69	2.3008	15 16 0.7	12.136
18	18 55 41.42	2.5017	22 44 48.2	6.490	18	20 51 1.60	2.2964	15 3 49.9	12.223
19	18 58 11.42	2.4983	22 38 14.4	6.638	19	20 53 19.26	2.2922	14 51 33.9	12.310
20	19 0 41.22	2.4948	22 31 31.7	6.784	20	20 55 36.66	2.2878	14 39 12.7	12.396
21	19 3 10.80	2.4913	22 24 40.3	6.930	21	20 57 53.80	2.2836	14 26 46.5	12.478
22	19 5 40.18	2.4878	22 17 40.1	7.074	22	21 0 10.69	2.2794	14 14 15.3	12.561
23	19 8 9.33	2.4840	22 10 31.4	7.218	23	21 2 27.33	2.2753	14 1 39.2	12.642
24	19 10 38.26	2.4803	-22 3 14.0	+7.361	24	21 4 43.72	2.2712	-13 48 58.3	+12.721

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 13.					MAY 15.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	21 4 43.72	2.2712	-13 48 58.3	+12.721	0	22 49 59.47	2.1389	-2 34 14.2	+14.853
1	21 6 59.87	2.2671	13 36 12.7	12.796	1	22 52 7.77	2.1378	2 19 22.7	14.863
2	21 9 15.77	2.2630	13 23 22.5	12.874	2	22 54 16.00	2.1367	2 4 30.6	14.873
3	21 11 31.43	2.2590	13 10 27.8	12.949	3	22 56 24.17	2.1358	1 49 38.0	14.881
4	21 13 46.85	2.2550	12 57 28.6	13.023	4	22 58 32.29	2.1348	1 34 44.9	14.887
5	21 16 2.03	2.2512	12 44 25.1	13.094	5	23 0 40.35	2.1339	1 19 51.6	14.891
6	21 18 16.99	2.2473	12 31 17.3	13.165	6	23 2 48.36	2.1333	1 4 58.0	14.896
7	21 20 31.71	2.2434	12 18 5.3	13.234	7	23 4 56.34	2.1326	0 50 4.2	14.898
8	21 22 46.20	2.2397	12 4 49.2	13.303	8	23 7 4.27	2.1319	0 35 10.3	14.898
9	21 25 0.47	2.2360	11 51 29.0	13.369	9	23 9 12.17	2.1313	0 20 16.4	14.898
10	21 27 14.52	2.2323	11 38 4.9	13.433	10	23 11 20.03	2.1306	-0 5 22.6	14.896
11	21 29 28.35	2.2287	11 24 37.0	13.497	11	23 13 27.87	2.1300	+0 9 31.0	14.892
12	21 31 41.96	2.2251	11 11 5.3	13.559	12	23 15 35.69	2.1302	0 24 24.4	14.888
13	21 33 55.36	2.2216	10 57 29.9	13.619	13	23 17 43.49	2.1299	0 39 17.5	14.883
14	21 36 8.55	2.2182	10 43 51.0	13.678	14	23 19 51.28	2.1297	0 54 10.3	14.875
15	21 38 21.54	2.2148	10 30 8.5	13.737	15	23 21 59.05	2.1296	1 9 2.5	14.866
16	21 40 34.32	2.2114	10 16 22.6	13.793	16	23 24 6.83	2.1296	1 23 54.2	14.856
17	21 42 46.91	2.2082	10 2 33.4	13.847	17	23 26 14.60	2.1296	1 38 45.2	14.845
18	21 44 59.30	2.2049	9 48 41.0	13.901	18	23 28 22.37	2.1297	1 53 35.6	14.833
19	21 47 11.50	2.2018	9 34 45.3	13.963	19	23 30 30.16	2.1298	2 8 25.1	14.818
20	21 49 23.51	2.1987	9 20 46.6	14.003	20	23 32 37.95	2.1300	2 23 13.7	14.803
21	21 51 35.34	2.1957	9 6 44.9	14.063	21	23 34 45.76	2.1308	2 38 1.4	14.787
22	21 53 46.99	2.1927	8 52 40.3	14.100	22	23 36 53.59	2.1308	2 52 48.1	14.768
23	21 55 58.46	2.1898	- 8 38 32.9	+14.147	23	23 39 1.45	2.1313	+3 7 33.6	+14.748
MAY 14.					MAY 16.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	21 58 9.76	2.1869	- 8 24 22.7	+14.192	0	23 41 9.34	2.1318	+3 22 17.9	+14.728
1	22 0 20.89	2.1841	8 10 9.9	14.235	1	23 43 17.26	2.1323	3 37 0.9	14.706
2	22 2 31.85	2.1814	7 55 54.5	14.278	2	23 45 25.21	2.1329	3 51 42.6	14.683
3	22 4 42.66	2.1788	7 41 36.6	14.318	3	23 47 33.21	2.1337	4 6 22.8	14.658
4	22 6 53.30	2.1761	7 27 16.3	14.358	4	23 49 41.25	2.1343	4 21 1.5	14.632
5	22 9 3.79	2.1736	7 12 53.7	14.396	5	23 51 49.33	2.1352	4 35 38.6	14.606
6	22 11 14.13	2.1712	6 58 28.8	14.433	6	23 53 57.47	2.1362	4 50 14.1	14.576
7	22 13 24.33	2.1688	6 44 1.8	14.468	7	23 56 5.67	2.1371	5 4 47.7	14.545
8	22 15 34.39	2.1665	6 29 32.7	14.501	8	23 58 13.92	2.1381	5 19 19.5	14.514
9	22 17 44.31	2.1642	6 15 1.7	14.533	9	0 0 22.24	2.1392	5 33 49.4	14.482
10	22 19 54.09	2.1620	6 0 28.7	14.565	10	0 2 30.62	2.1403	5 48 17.3	14.448
11	22 22 3.75	2.1599	5 45 53.9	14.594	11	0 4 39.08	2.1416	6 2 43.2	14.413
12	22 24 13.28	2.1578	5 31 17.4	14.623	12	0 6 47.61	2.1428	6 17 6.8	14.375
13	22 26 22.69	2.1559	5 16 39.2	14.649	13	0 8 56.22	2.1442	6 31 28.2	14.338
14	22 28 31.99	2.1540	5 1 59.5	14.674	14	0 11 4.91	2.1456	6 45 47.3	14.298
15	22 30 41.17	2.1521	4 47 18.3	14.698	15	0 13 13.69	2.1471	7 0 4.0	14.258
16	22 32 50.24	2.1503	4 32 35.7	14.721	16	0 15 22.56	2.1486	7 14 18.2	14.216
17	22 34 59.21	2.1487	4 17 51.8	14.743	17	0 17 31.52	2.1501	7 28 29.9	14.173
18	22 37 8.08	2.1471	4 3 6.6	14.763	18	0 19 40.57	2.1518	7 42 38.9	14.128
19	22 39 16.86	2.1456	3 48 20.3	14.781	19	0 21 49.73	2.1535	7 56 45.2	14.082
20	22 41 25.55	2.1441	3 33 32.9	14.798	20	0 23 58.99	2.1553	8 10 48.7	14.034
21	22 43 34.15	2.1426	3 18 44.5	14.814	21	0 26 8.36	2.1570	8 24 49.3	13.986
22	22 45 42.66	2.1413	3 3 55.2	14.828	22	0 28 17.83	2.1588	8 38 47.0	13.936
23	22 47 51.10	2.1401	2 49 5.1	14.842	23	0 30 27.42	2.1608	8 52 41.6	13.883
24	22 49 59.47	2.1389	- 2 34 14.2	+14.853	24	0 32 37.13	2.1628	+9 6 33.0	+13.831

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 17.					MAY 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 32 37.13	2.1628	+ 9 6 33.0	+13.831	0	2 19 24.06	2.2946	+18 45 30.0	+9.821
1	0 34 46.96	2.1648	9 20 21.3	13.778	1	2 21 41.82	2.2976	18 55 15.9	9.708
2	0 36 56.90	2.1668	9 34 6.3	13.723	2	2 23 59.78	2.3004	19 4 55.0	9.596
3	0 39 6.97	2.1690	9 47 48.0	13.666	3	2 26 17.87	2.3033	19 14 27.3	9.481
4	0 41 17.17	2.1711	10 1 26.2	13.608	4	2 28 36.15	2.3061	19 23 52.7	9.366
5	0 43 27.50	2.1733	10 15 0.9	13.548	5	2 30 54.60	2.3090	19 33 11.2	9.250
6	0 45 37.97	2.1756	10 28 32.0	13.488	6	2 33 13.23	2.3118	19 42 22.7	9.133
7	0 47 48.57	2.1778	10 41 59.5	13.427	7	2 35 32.02	2.3145	19 51 27.1	9.013
8	0 49 59.30	2.1802	10 55 23.2	13.363	8	2 37 50.97	2.3173	20 0 24.3	8.894
9	0 52 10.19	2.1826	11 8 43.0	13.298	9	2 40 10.10	2.3201	20 9 14.4	8.775
10	0 54 21.21	2.1849	11 21 59.0	13.233	10	2 42 29.38	2.3227	20 17 57.3	8.654
11	0 56 32.38	2.1874	11 35 11.0	13.167	11	2 44 48.82	2.3258	20 26 32.9	8.532
12	0 58 43.70	2.1899	11 48 19.0	13.098	12	2 47 8.42	2.3289	20 35 1.1	8.409
13	1 0 55.17	2.1925	12 1 22.8	13.028	13	2 49 28.18	2.3306	20 43 22.0	8.286
14	1 3 6.80	2.1951	12 14 22.4	12.958	14	2 51 48.09	2.3331	20 51 35.4	8.161
15	1 5 18.58	2.1977	12 27 17.7	12.886	15	2 54 8.15	2.3356	20 59 41.3	8.036
16	1 7 30.52	2.2003	12 40 8.7	12.813	16	2 56 28.36	2.3380	21 7 39.7	7.911
17	1 9 42.62	2.2030	12 52 55.2	12.737	17	2 58 48.71	2.3408	21 15 30.6	7.783
18	1 11 54.88	2.2058	13 5 37.1	12.661	18	3 1 9.20	2.3428	21 23 13.7	7.655
19	1 14 7.31	2.2085	13 18 14.5	12.585	19	3 3 29.84	2.3451	21 30 49.2	7.523
20	1 16 19.90	2.2113	13 30 47.3	12.506	20	3 5 50.61	2.3473	21 38 17.0	7.398
21	1 18 32.66	2.2140	13 43 15.2	12.426	21	3 8 11.61	2.3494	21 45 36.9	7.268
22	1 20 45.58	2.2168	13 55 38.4	12.346	22	3 10 32.54	2.3515	21 52 49.1	7.138
23	1 22 58.68	2.2197	+14 7 56.7	+12.263	23	3 12 53.69	2.3536	+21 59 53.4	+7.006
MAY 18.					MAY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 25 11.94	2.2225	+14 20 10.0	+12.180	0	3 15 14.97	2.3557	+22 6 49.8	+6.874
1	1 27 25.38	2.2255	14 32 18.3	12.095	1	3 17 36.37	2.3576	22 13 38.3	6.741
2	1 29 39.00	2.2284	14 44 21.4	12.008	2	3 19 57.88	2.3594	22 20 18.7	6.608
3	1 31 52.79	2.2313	14 56 19.3	11.922	3	3 22 19.50	2.3613	22 26 51.2	6.474
4	1 34 6.76	2.2343	15 8 12.0	11.833	4	3 24 41.23	2.3630	22 33 15.6	6.339
5	1 36 20.90	2.2373	15 19 59.3	11.743	5	3 27 3.06	2.3647	22 39 31.9	6.203
6	1 38 35.23	2.2403	15 31 41.2	11.653	6	3 29 24.99	2.3663	22 45 40.0	6.068
7	1 40 49.73	2.2432	15 43 17.6	11.561	7	3 31 47.01	2.3678	22 51 40.1	5.933
8	1 43 4.41	2.2463	15 54 48.5	11.468	8	3 34 9.13	2.3693	22 57 31.9	5.795
9	1 45 19.28	2.2493	16 6 13.7	11.373	9	3 36 31.83	2.3707	23 3 15.5	5.658
10	1 47 34.32	2.2523	16 17 33.3	11.278	10	3 38 53.61	2.3720	23 8 50.8	5.520
11	1 49 49.55	2.2553	16 28 47.1	11.181	11	3 41 15.97	2.3733	23 14 17.9	5.382
12	1 52 4.96	2.2583	16 39 55.0	11.083	12	3 43 38.40	2.3744	23 19 36.6	5.243
13	1 54 20.55	2.2614	16 50 57.0	10.984	13	3 46 0.90	2.3755	23 24 47.0	5.104
14	1 56 36.33	2.2644	17 1 53.1	10.884	14	3 48 23.46	2.3765	23 29 49.1	4.965
15	1 58 52.28	2.2674	17 12 43.1	10.783	15	3 50 46.08	2.3775	23 34 42.8	4.824
16	2 1 8.42	2.2705	17 23 27.0	10.680	16	3 53 8.76	2.3783	23 39 28.0	4.684
17	2 3 24.74	2.2736	17 34 4.7	10.577	17	3 55 31.48	2.3790	23 44 4.9	4.544
18	2 5 41.25	2.2766	17 44 36.2	10.472	18	3 57 54.24	2.3798	23 48 33.3	4.403
19	2 7 57.93	2.2796	17 55 1.3	10.366	19	4 0 17.05	2.3803	23 52 53.2	4.262
20	2 10 14.80	2.2826	18 5 20.1	10.259	20	4 2 39.88	2.3808	23 57 4.7	4.121
21	2 12 31.84	2.2856	18 15 32.4	10.151	21	4 5 2.75	2.3813	24 1 7.7	3.979
22	2 14 49.07	2.2886	18 25 38.2	10.042	22	4 7 25.64	2.3816	24 5 2.2	3.837
23	2 17 6.47	2.2916	18 35 37.4	9.932	23	4 9 48.54	2.3818	24 8 48.1	3.694
24	2 19 24.06	2.2946	+18 45 30.0	+9.821	24	4 12 11.45	2.3819	+24 12 25.5	+3.553

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
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MAY 21.					MAY 23.				
	h	m	s	"		h	m	s	"
0	4	12	11.45	2.3819	+24	12	25.5	+3.553	
1	4	14	34.37	2.3821	24	15	54.4	3.410	
2	4	16	57.30	2.3821	24	19	14.7	3.298	
3	4	19	20.22	2.3819	24	22	26.5	3.125	
4	4	21	43.13	2.3817	24	25	29.7	2.983	
5	4	24	6.02	2.3813	24	28	24.4	2.840	
6	4	26	28.89	2.3810	24	31	10.5	2.697	
7	4	28	51.74	2.3805	24	33	48.0	2.553	
8	4	31	14.55	2.3799	24	36	16.9	2.411	
9	4	33	37.33	2.3793	24	38	37.3	2.268	
10	4	36	0.06	2.3785	24	40	49.1	2.126	
11	4	38	22.75	2.3777	24	42	52.4	1.983	
12	4	40	45.38	2.3767	24	44	47.0	1.839	
13	4	43	7.95	2.3757	24	46	33.1	1.696	
14	4	45	30.46	2.3746	24	48	10.7	1.555	
15	4	47	52.90	2.3733	24	49	39.7	1.413	
16	4	50	15.26	2.3720	24	51	0.3	1.272	
17	4	52	37.54	2.3706	24	52	12.3	1.129	
18	4	54	59.73	2.3691	24	53	15.8	0.988	
19	4	57	21.83	2.3676	24	54	10.8	0.847	
20	4	59	43.84	2.3658	24	54	57.4	0.706	
21	5	2	5.73	2.3640	24	55	35.5	0.565	
22	5	4	27.52	2.3622	24	56	5.2	0.424	
23	5	6	49.19	2.3602	+24	56	26.4	+0.284	

MAY 22.					MAY 24.				
	h	m	s	"		h	m	s	"
0	5	9	10.74	2.3582	+24	56	39.3	+0.145	
1	5	11	32.17	2.3560	24	56	43.8	+0.005	
2	5	13	53.46	2.3538	24	56	39.9	-0.134	
3	5	16	14.62	2.3515	24	56	27.7	0.272	
4	5	18	35.64	2.3491	24	56	7.3	0.410	
5	5	20	56.51	2.3467	24	55	38.5	0.548	
6	5	23	17.24	2.3441	24	55	1.5	0.685	
7	5	25	37.80	2.3414	24	54	16.3	0.823	
8	5	27	58.21	2.3387	24	53	22.8	0.959	
9	5	30	18.44	2.3358	24	52	21.2	1.094	
10	5	32	38.51	2.3330	24	51	11.5	1.229	
11	5	34	58.40	2.3301	24	49	53.7	1.364	
12	5	37	18.12	2.3271	24	48	27.8	1.498	
13	5	39	37.65	2.3238	24	46	53.9	1.633	
14	5	41	56.98	2.3207	24	45	11.9	1.766	
15	5	44	16.13	2.3174	24	43	22.0	1.898	
16	5	46	35.07	2.3140	24	41	24.2	2.029	
17	5	48	53.81	2.3107	24	39	18.5	2.160	
18	5	51	12.35	2.3073	24	37	5.0	2.291	
19	5	53	30.68	2.3037	24	34	43.6	2.421	
20	5	55	48.79	2.3000	24	32	14.5	2.549	
21	5	58	6.68	2.2963	24	29	37.7	2.678	
22	6	0	24.35	2.2927	24	26	53.1	2.807	
23	6	2	41.80	2.2888	24	24	0.9	2.933	
24	6	4	59.01	2.2849	+24	21	1.2	-3.058	

	h	m	s	"		h	m	s	"
0	6	4	59.01	2.2849	+24	21	1.2	-3.058	
1	6	7	15.99	2.2810	24	17	53.9	3.184	
2	6	9	32.73	2.2770	24	14	39.1	3.309	
3	6	11	49.23	2.2730	24	11	16.8	3.433	
4	6	14	5.49	2.2689	24	7	47.1	3.557	
5	6	16	21.50	2.2648	24	4	10.0	3.679	
6	6	18	37.26	2.2606	24	0	25.6	3.801	
7	6	20	52.77	2.2563	23	56	33.9	3.922	
8	6	23	8.02	2.2520	23	52	35.0	4.042	
9	6	25	23.01	2.2477	23	48	28.9	4.161	
10	6	27	37.74	2.2433	23	44	15.7	4.278	
11	6	29	52.21	2.2388	23	39	55.5	4.396	
12	6	32	6.40	2.2343	23	35	28.2	4.513	
13	6	34	20.33	2.2299	23	30	53.9	4.628	
14	6	36	33.99	2.2253	23	26	12.8	4.743	
15	6	38	47.37	2.2208	23	21	24.7	4.858	
16	6	41	0.48	2.2162	23	16	29.8	4.971	
17	6	43	13.31	2.2115	23	11	28.2	5.083	
18	6	45	25.86	2.2068	23	6	19.9	5.194	
19	6	47	38.13	2.2022	23	1	4.9	5.305	
20	6	49	50.12	2.1974	22	55	43.3	5.415	
21	6	52	1.82	2.1927	22	50	15.1	5.523	
22	6	54	13.24	2.1879	22	44	40.5	5.631	
23	6	56	24.37	2.1831	+22	38	59.4	-5.738	

	h	m	s	"		h	m	s	"
0	6	58	35.21	2.1783	+22	33	11.9	-5.844	
1	7	0	45.76	2.1734	22	27	18.1	5.949	
2	7	2	56.02	2.1686	22	21	18.0	6.053	
3	7	5	5.99	2.1638	22	15	11.7	6.156	
4	7	7	15.67	2.1589	22	8	59.3	6.258	
5	7	9	25.06	2.1540	22	2	40.7	6.360	
6	7	11	34.15	2.1490	21	56	16.1	6.460	
7	7	13	42.94	2.1442	21	49	45.5	6.560	
8	7	15	51.45	2.1393	21	43	8.9	6.659	
9	7	17	59.65	2.1343	21	36	26.4	6.757	
10	7	20	7.57	2.1294	21	29	38.1	6.853	
11	7	22	15.18	2.1244	21	22	44.1	6.948	
12	7	24	22.50	2.1195	21	15	44.3	7.044	
13	7	26	29.52	2.1146	21	8	38.8	7.138	
14	7	28	36.25	2.1098	21	1	27.7	7.231	
15	7	30	42.69	2.1048	20	54	11.1	7.323	
16	7	32	48.83	2.0998	20	46	49.0	7.414	
17	7	34	54.67	2.0949	20	39	21.4	7.505	
18	7	37	0.22	2.0901	20	31	48.4	7.594	
19	7	39	5.48	2.0852	20	24	10.1	7.683	
20	7	41	10.44	2.0803	20	16	26.5	7.770	
21	7	43	15.11	2.0754	20	8	37.7	7.856	
22	7	45	19.49	2.0706	20	0	43.8	7.942	
23	7	47	23.58	2.0658	19	52	44.7	8.027	
24	7	49	27.38	2.0609	+19	44	40.6	-8.110	

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 25.					MAY 27.				
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>
0	7 49 27.38	2.0609	+19 44 40.6	-8.110	0	9 23 25.00	1.8701	+11 55 9.7	-11.143
1	7 51 30.89	2.0602	19 36 31.5	8.193	1	9 25 17.12	1.8673	11 43 59.8	11.187
2	7 53 34.12	2.0614	19 28 17.4	8.275	2	9 27 9.08	1.8646	11 32 47.3	11.230
3	7 55 37.06	2.0466	19 19 58.5	8.356	3	9 29 0.87	1.8619	11 21 32.2	11.273
4	7 57 39.71	2.0418	19 11 34.7	8.437	4	9 30 52.51	1.8593	11 10 14.5	11.316
5	7 59 42.08	2.0372	19 3 6.1	8.516	5	9 32 43.99	1.8567	10 58 54.3	11.358
6	8 1 44.17	2.0325	18 54 32.8	8.595	6	9 34 35.31	1.8542	10 47 31.6	11.398
7	8 3 45.98	2.0278	18 45 54.7	8.673	7	9 36 26.49	1.8518	10 36 6.5	11.438
8	8 5 47.51	2.0232	18 37 12.1	8.748	8	9 38 17.52	1.8493	10 24 39.0	11.478
9	8 7 48.76	2.0185	18 28 24.9	8.824	9	9 40 8.41	1.8470	10 13 9.1	11.518
10	8 9 49.73	2.0139	18 19 33.2	8.900	10	9 41 59.16	1.8448	10 1 36.9	11.555
11	8 11 50.43	2.0094	18 10 36.9	8.974	11	9 43 49.78	1.8426	9 50 2.5	11.593
12	8 13 50.86	2.0049	18 1 36.3	9.047	12	9 45 40.27	1.8404	9 38 25.8	11.630
13	8 15 51.02	2.0004	17 52 31.3	9.119	13	9 47 30.63	1.8383	9 26 46.9	11.666
14	8 17 50.91	1.9959	17 43 22.0	9.190	14	9 49 20.87	1.8363	9 15 5.9	11.702
15	8 19 50.53	1.9915	17 34 8.5	9.261	15	9 51 10.99	1.8343	9 3 22.7	11.738
16	8 21 49.89	1.9872	17 24 50.7	9.332	16	9 53 0.99	1.8323	8 51 37.4	11.772
17	8 23 48.99	1.9828	17 15 28.7	9.400	17	9 54 50.87	1.8305	8 39 50.1	11.806
18	8 25 47.83	1.9785	17 6 2.7	9.468	18	9 56 40.65	1.8288	8 28 0.8	11.838
19	8 27 46.41	1.9743	16 56 32.6	9.535	19	9 58 30.33	1.8270	8 16 9.5	11.871
20	8 29 44.74	1.9701	16 46 58.5	9.602	20	10 0 19.89	1.8253	8 4 16.3	11.903
21	8 31 42.82	1.9658	16 37 20.4	9.668	21	10 2 9.37	1.8238	7 52 21.2	11.934
22	8 33 40.64	1.9616	16 27 38.4	9.732	22	10 3 58.75	1.8223	7 40 24.2	11.965
23	8 35 38.21	1.9575	+16 17 52.6	-9.796	23	10 5 48.05	1.8209	+ 7 28 25.4	-11.994
MAY 26.					MAY 28.				
	<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>		<i>h m s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>
0	8 37 35.54	1.9535	+16 8 2.9	-9.859	0	10 7 37.26	1.8195	+ 7 16 24.9	-12.023
1	8 39 32.63	1.9494	15 58 9.5	9.921	1	10 9 26.39	1.8182	7 4 22.6	12.062
2	8 41 29.47	1.9454	15 48 12.4	9.983	2	10 11 15.44	1.8168	6 52 18.7	12.099
3	8 43 26.08	1.9415	15 38 11.6	10.044	3	10 13 4.41	1.8157	6 40 13.0	12.108
4	8 45 22.45	1.9376	15 28 7.1	10.104	4	10 14 53.32	1.8146	6 28 5.8	12.134
5	8 47 18.59	1.9338	15 17 59.1	10.163	5	10 16 42.16	1.8135	6 15 56.9	12.161
6	8 49 14.50	1.9299	15 7 47.6	10.221	6	10 18 30.94	1.8125	6 3 46.5	12.186
7	8 51 10.18	1.9262	14 57 32.6	10.278	7	10 20 19.66	1.8116	5 51 34.6	12.212
8	8 53 5.64	1.9225	14 47 14.2	10.335	8	10 22 8.33	1.8108	5 39 21.1	12.236
9	8 55 0.88	1.9188	14 36 52.4	10.392	9	10 23 56.95	1.8099	5 27 6.3	12.259
10	8 56 55.90	1.9152	14 26 27.2	10.447	10	10 25 45.52	1.8092	5 14 50.0	12.283
11	8 58 50.70	1.9117	14 15 58.8	10.501	11	10 27 34.05	1.8085	5 2 32.4	12.306
12	9 0 45.30	1.9082	14 5 27.1	10.555	12	10 29 22.54	1.8079	4 50 13.4	12.327
13	9 2 39.68	1.9047	13 54 52.2	10.608	13	10 31 11.00	1.8073	4 37 53.2	12.348
14	9 4 33.86	1.9013	13 44 14.2	10.660	14	10 32 59.42	1.8069	4 25 31.6	12.369
15	9 6 27.83	1.8979	13 33 33.0	10.712	15	10 34 47.83	1.8066	4 13 8.9	12.388
16	9 8 21.61	1.8947	13 22 48.8	10.763	16	10 36 36.21	1.8062	4 0 45.0	12.406
17	9 10 15.19	1.8913	13 12 1.5	10.813	17	10 38 24.57	1.8059	3 48 19.9	12.428
18	9 12 8.57	1.8881	13 1 11.3	10.862	18	10 40 12.92	1.8058	3 35 53.7	12.446
19	9 14 1.76	1.8850	12 50 18.1	10.911	19	10 42 1.26	1.8056	3 23 26.4	12.463
20	9 15 54.77	1.8820	12 39 22.0	10.958	20	10 43 49.59	1.8055	3 10 58.1	12.480
21	9 17 47.60	1.8789	12 28 23.1	11.005	21	10 45 37.92	1.8056	2 58 28.8	12.497
22	9 19 40.24	1.8759	12 17 21.4	11.052	22	10 47 26.26	1.8057	2 45 58.5	12.513
23	9 21 32.71	1.8730	12 6 16.9	11.098	23	10 49 14.60	1.8058	2 33 27.3	12.528
24	9 23 25.00	1.8701	+11 55 9.7	-11.143	24	10 51 2.96	1.8061	+ 2 20 55.2	-12.542

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 29.					MAY 31.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	10 51 2.96	1.8061	+2 20 55.2	-12.542	0	12 19 20.08	1.8000	-7 45 27.6	-12.452
1	10 52 51.33	1.8063	2 8 22.3	12.556	1	12 21 14.19	1.8037	7 57 54.1	12.432
2	10 54 39.72	1.8067	1 55 48.5	12.570	2	12 23 8.52	1.8074	8 10 19.4	12.411
3	10 56 28.13	1.8071	1 43 13.9	12.583	3	12 25 3.08	1.9118	8 22 43.4	12.389
4	10 58 16.57	1.8076	1 30 38.6	12.594	4	12 26 57.87	1.9153	8 35 6.1	12.366
5	11 0 5.04	1.8082	1 18 2.6	12.608	5	12 28 52.90	1.9192	8 47 27.3	12.341
6	11 1 53.55	1.8088	1 5 26.0	12.616	6	12 30 48.17	1.9233	8 59 47.0	12.317
7	11 3 42.10	1.8096	0 52 48.7	12.627	7	12 32 43.69	1.9273	9 12 5.3	12.292
8	11 5 30.69	1.8108	0 40 10.8	12.637	8	12 34 39.45	1.9316	9 24 22.0	12.264
9	11 7 19.34	1.8112	0 27 32.3	12.645	9	12 36 35.48	1.9358	9 36 37.0	12.236
10	11 9 8.03	1.8120	0 14 53.4	12.653	10	12 38 31.75	1.9403	9 48 50.3	12.206
11	11 10 56.78	1.8131	+0 2 13.9	12.661	11	12 40 28.30	1.9446	10 1 1.9	12.178
12	11 12 45.60	1.8142	-0 10 25.9	12.668	12	12 42 25.10	1.9490	10 13 11.7	12.148
13	11 14 34.48	1.8153	0 23 6.2	12.674	13	12 44 22.18	1.9536	10 25 19.7	12.117
14	11 16 23.43	1.8165	0 35 46.8	12.680	14	12 46 19.53	1.9582	10 37 25.7	12.084
15	11 18 12.46	1.8178	0 48 27.8	12.685	15	12 48 17.16	1.9628	10 49 29.8	12.051
16	11 20 1.56	1.8191	1 1 9.0	12.690	16	12 50 15.07	1.9676	11 1 31.8	12.016
17	11 21 50.75	1.8206	1 13 50.5	12.693	17	12 52 13.27	1.9723	11 13 31.7	11.981
18	11 23 40.03	1.8220	1 26 32.2	12.697	18	12 54 11.75	1.9773	11 25 29.5	11.944
19	11 25 29.39	1.8235	1 39 14.1	12.698	19	12 56 10.54	1.9822	11 37 25.0	11.907
20	11 27 18.85	1.8252	1 51 56.0	12.700	20	12 58 9.61	1.9871	11 49 18.3	11.868
21	11 29 8.41	1.8269	2 4 38.1	12.702	21	13 0 8.99	1.9923	12 1 9.2	11.828
22	11 30 58.08	1.8287	2 17 20.2	12.702	22	13 2 8.68	1.9974	12 12 57.7	11.788
23	11 32 47.85	1.8305	-2 30 2.3	-12.701	23	13 4 8.68	2.0026	-12 24 43.8	-11.746
MAY 30.					JUNE 1.				
0	11 34 37.74	1.8325	-2 42 44.3	-12.700	0	13 6 8.90	2.0078	-12 36 27.2	-11.708
1	11 36 27.75	1.8344	2 55 26.3	12.698	1	13 8 9.62	2.0131	12 48 8.1	11.659
2	11 38 17.87	1.8365	3 8 8.1	12.696	2	13 10 10.56	2.0185	12 59 46.3	11.613
3	11 40 8.13	1.8387	3 20 49.8	12.693	3	13 12 11.84	2.0240	13 11 21.7	11.568
4	11 41 58.51	1.8408	3 33 31.2	12.689	4	13 14 13.44	2.0294	13 22 54.4	11.521
5	11 43 49.03	1.8431	3 46 12.5	12.685	5	13 16 15.37	2.0349	13 34 24.2	11.472
6	11 45 39.68	1.8454	3 58 53.4	12.678	6	13 18 17.63	2.0406	13 45 51.0	11.423
7	11 47 30.48	1.8479	4 11 33.9	12.673	7	13 20 20.24	2.0463	13 57 14.9	11.372
8	11 49 21.43	1.8503	4 24 14.1	12.667	8	13 22 23.18	2.0519	14 8 35.6	11.320
9	11 51 12.52	1.8528	4 36 53.9	12.659	9	13 24 26.47	2.0578	14 19 53.3	11.267
10	11 53 3.77	1.8556	4 49 33.2	12.651	10	13 26 30.11	2.0636	14 31 7.6	11.212
11	11 54 55.19	1.8583	5 2 12.0	12.642	11	13 28 34.10	2.0694	14 42 18.7	11.158
12	11 56 46.76	1.8610	5 14 50.2	12.632	12	13 30 38.44	2.0753	14 53 26.5	11.101
13	11 58 38.51	1.8639	5 27 27.8	12.621	13	13 32 43.14	2.0814	15 4 30.8	11.043
14	12 0 30.43	1.8668	5 40 4.7	12.610	14	13 34 48.21	2.0874	15 15 31.6	10.983
15	12 2 22.53	1.8698	5 52 41.0	12.598	15	13 36 53.63	2.0934	15 26 28.7	10.923
16	12 4 14.80	1.8728	6 5 16.5	12.585	16	13 38 59.42	2.0997	15 37 22.3	10.862
17	12 6 7.27	1.8760	6 17 51.2	12.571	17	13 41 5.59	2.1063	15 48 12.1	10.798
18	12 7 59.92	1.8792	6 30 25.0	12.557	18	13 43 12.12	2.1121	15 58 56.0	10.733
19	12 9 52.77	1.8825	6 42 58.0	12.542	19	13 45 19.04	2.1183	16 9 40.1	10.668
20	12 11 45.82	1.8858	6 55 30.0	12.525	20	13 47 26.32	2.1247	16 20 18.2	10.602
21	12 13 39.07	1.8893	7 8 1.0	12.508	21	13 49 34.00	2.1311	16 30 52.3	10.534
22	12 15 32.58	1.8928	7 20 31.0	12.491	22	13 51 42.05	2.1374	16 41 22.3	10.464
23	12 17 26.20	1.8963	7 32 59.9	12.472	23	13 53 50.49	2.1439	16 51 48.0	10.393
24	12 19 20.06	1.8999	-7 45 27.6	-12.452	24	13 55 59.32	2.1504	-17 2 9.5	-10.322

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 2.					JUNE 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 55 59.32	2.1504	-17 2 9.5	-10.322	0	15 46 57.51	2.4684	-23 27 49.0	-5.198
1	13 58 8.54	2.1569	17 12 26.6	10.248	1	15 49 25.79	2.4742	23 32 56.7	5.068
2	14 0 18.15	2.1634	17 22 39.2	10.173	2	15 51 54.41	2.4799	23 37 55.9	4.915
3	14 2 28.15	2.1700	17 32 47.3	10.097	3	15 54 23.38	2.4856	23 42 46.5	4.772
4	14 4 38.55	2.1767	17 42 50.8	10.019	4	15 56 52.68	2.4910	23 47 28.5	4.627
5	14 6 49.35	2.1833	17 52 49.6	9.940	5	15 59 22.30	2.4964	23 52 1.7	4.481
6	14 9 0.55	2.1900	18 2 43.6	9.860	6	16 1 52.25	2.5018	23 56 26.2	4.333
7	14 11 12.15	2.1968	18 12 32.8	9.779	7	16 4 22.52	2.5071	24 0 41.7	4.185
8	14 13 24.16	2.2034	18 22 17.1	9.696	8	16 6 53.10	2.5123	24 4 48.4	4.036
9	14 15 36.56	2.2102	18 31 56.3	9.611	9	16 9 23.99	2.5173	24 8 46.0	3.885
10	14 17 49.38	2.2170	18 41 30.4	9.525	10	16 11 55.18	2.5223	24 12 34.6	3.733
11	14 20 2.60	2.2238	18 50 59.3	9.438	11	16 14 26.66	2.5271	24 16 14.0	3.580
12	14 22 16.23	2.2306	19 0 23.0	9.350	12	16 16 58.43	2.5319	24 19 44.2	3.426
13	14 24 30.27	2.2374	19 9 41.3	9.259	13	16 19 30.49	2.5365	24 23 5.1	3.271
14	14 26 44.72	2.2443	19 18 54.1	9.168	14	16 22 2.81	2.5410	24 26 16.7	3.116
15	14 28 59.58	2.2511	19 28 1.4	9.075	15	16 24 35.41	2.5455	24 29 19.0	2.958
16	14 31 14.85	2.2580	19 37 3.1	8.980	16	16 27 8.27	2.5498	24 32 11.7	2.800
17	14 33 30.54	2.2649	19 45 59.0	8.884	17	16 29 41.39	2.5540	24 34 55.0	2.642
18	14 35 46.64	2.2718	19 54 49.2	8.788	18	16 32 14.75	2.5580	24 37 28.7	2.482
19	14 38 3.15	2.2786	20 3 33.5	8.688	19	16 34 48.35	2.5619	24 39 52.8	2.321
20	14 40 20.07	2.2855	20 12 11.8	8.588	20	16 37 22.18	2.5658	24 42 7.2	2.160
21	14 42 37.41	2.2924	20 20 44.1	8.487	21	16 39 56.24	2.5694	24 44 12.0	1.998
22	14 44 55.16	2.2993	20 29 10.2	8.384	22	16 42 30.51	2.5730	24 46 6.9	1.834
23	14 47 13.32	2.3062	-20 37 30.2	-8.279	23	16 45 5.00	2.5764	-24 47 52.1	-1.671
JUNE 3.					JUNE 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 49 31.90	2.3131	-20 45 43.7	-8.173	0	16 47 39.68	2.5797	-24 49 27.4	-1.506
1	14 51 50.89	2.3199	20 53 50.9	8.066	1	16 50 14.56	2.5828	24 50 52.8	1.341
2	14 54 10.29	2.3267	21 1 51.6	7.967	2	16 52 49.62	2.5859	24 52 8.3	1.175
3	14 56 30.09	2.3335	21 9 45.7	7.847	3	16 55 24.87	2.5888	24 53 13.8	1.008
4	14 58 50.31	2.3403	21 17 33.2	7.735	4	16 58 0.27	2.5914	24 54 9.3	0.842
5	15 1 10.93	2.3472	21 25 13.9	7.621	5	17 0 35.84	2.5941	24 54 54.8	0.674
6	15 3 31.97	2.3539	21 32 47.7	7.507	6	17 3 11.56	2.5966	24 55 30.2	0.506
7	15 5 53.40	2.3606	21 40 14.7	7.391	7	17 5 47.43	2.5988	24 55 55.4	0.337
8	15 8 15.24	2.3673	21 47 34.6	7.273	8	17 8 23.42	2.6010	24 56 10.6	-0.168
9	15 10 37.48	2.3740	21 54 47.4	7.153	9	17 10 59.55	2.6031	24 56 15.6	+0.003
10	15 13 0.12	2.3807	22 1 53.0	7.033	10	17 13 35.79	2.6049	24 56 10.3	0.173
11	15 15 23.16	2.3873	22 8 51.3	6.910	11	17 16 12.14	2.6066	24 55 54.9	0.342
12	15 17 46.59	2.3938	22 15 42.2	6.787	12	17 18 48.58	2.6082	24 55 29.3	0.513
13	15 20 10.41	2.4003	22 22 25.7	6.663	13	17 21 25.12	2.6097	24 54 53.4	0.683
14	15 22 34.63	2.4068	22 29 1.7	6.537	14	17 24 1.74	2.6110	24 54 7.3	0.854
15	15 24 59.23	2.4133	22 35 30.1	6.409	15	17 26 38.44	2.6121	24 53 10.9	1.026
16	15 27 24.22	2.4196	22 41 50.8	6.280	16	17 29 15.19	2.6130	24 52 4.2	1.198
17	15 29 49.58	2.4259	22 48 3.7	6.149	17	17 31 52.00	2.6139	24 50 47.2	1.369
18	15 32 15.33	2.4323	22 54 8.7	6.017	18	17 34 28.86	2.6147	24 49 19.9	1.541
19	15 34 41.45	2.4383	23 0 5.7	5.884	19	17 37 5.76	2.6152	24 47 42.3	1.712
20	15 37 7.93	2.4445	23 5 54.8	5.750	20	17 39 42.68	2.6155	24 45 54.5	1.883
21	15 39 34.79	2.4506	23 11 35.7	5.614	21	17 42 19.62	2.6158	24 43 56.3	2.056
22	15 42 2.00	2.4566	23 17 8.5	5.477	22	17 44 56.57	2.6159	24 41 47.8	2.227
23	15 44 29.58	2.4626	23 22 32.9	5.338	23	17 47 33.53	2.6158	24 39 29.1	2.398
24	15 46 57.51	2.4684	-23 27 49.0	-5.198	24	17 50 10.47	2.6156	-24 37 0.0	+2.570

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 6.					JUNE 8.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	17 50 10.47	2.6156	-24 37 0.0	+2.570	0	19 53 3.94	2.4663	-19 27 33.9	+ 9.947
1	17 52 47.40	2.6153	24 34 20.7	2.741	1	19 55 31.77	2.4613	19 17 33.3	10.072
2	17 55 24.30	2.6148	24 31 31.1	2.913	2	19 57 59.30	2.4563	19 7 25.3	10.194
3	17 58 1.17	2.6142	24 28 31.2	3.083	3	20 0 26.52	2.4512	18 57 10.0	10.316
4	18 0 38.00	2.6133	24 25 21.1	3.253	4	20 2 53.44	2.4461	18 46 47.4	10.437
5	18 3 14.77	2.6124	24 22 0.9	3.423	5	20 5 20.05	2.4409	18 36 17.6	10.555
6	18 5 51.49	2.6113	24 18 30.4	3.593	6	20 7 46.35	2.4358	18 25 40.8	10.672
7	18 8 28.13	2.6102	24 14 49.7	3.763	7	20 10 12.35	2.4307	18 14 57.0	10.787
8	18 11 4.71	2.6088	24 10 58.9	3.931	8	20 12 38.03	2.4254	18 4 6.4	10.901
9	18 13 41.19	2.6073	24 6 58.0	4.099	9	20 15 3.40	2.4203	17 53 8.9	11.013
10	18 16 17.59	2.6058	24 2 47.0	4.267	10	20 17 28.46	2.4151	17 42 4.8	11.123
11	18 18 53.88	2.6040	23 58 26.0	4.434	11	20 19 53.21	2.4099	17 30 54.1	11.233
12	18 21 30.07	2.6022	23 53 54.9	4.601	12	20 22 17.65	2.4047	17 19 36.9	11.340
13	18 24 6.14	2.6001	23 49 13.9	4.767	13	20 24 41.77	2.3994	17 8 13.3	11.446
14	18 26 42.08	2.5979	23 44 22.9	4.933	14	20 27 5.58	2.3943	16 56 43.5	11.549
15	18 29 17.89	2.5957	23 39 22.0	5.097	15	20 29 29.08	2.3891	16 45 7.4	11.653
16	18 31 53.56	2.5933	23 34 11.3	5.261	16	20 31 52.27	2.3839	16 33 25.2	11.753
17	18 34 29.08	2.5908	23 28 50.7	5.424	17	20 34 15.15	2.3787	16 21 37.0	11.853
18	18 37 4.45	2.5882	23 23 20.4	5.586	18	20 36 37.71	2.3735	16 9 42.9	11.949
19	18 39 39.66	2.5854	23 17 40.4	5.748	19	20 38 59.97	2.3683	15 57 43.1	12.045
20	18 42 14.70	2.5825	23 11 50.7	5.908	20	20 41 21.91	2.3632	15 45 37.5	12.140
21	18 44 49.56	2.5795	23 5 51.4	6.068	21	20 43 43.55	2.3581	15 33 26.3	12.233
22	18 47 24.24	2.5765	22 59 42.5	6.227	22	20 46 4.88	2.3529	15 21 9.5	12.324
23	18 49 58.74	2.5733	-22 53 24.2	+6.384	23	20 48 25.90	2.3478	-15 8 47.4	+12.413
JUNE 7.					JUNE 9.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	18 52 33.04	2.5700	-22 46 56.4	+6.542	0	20 50 46.61	2.3427	-14 56 20.0	+12.500
1	18 55 7.14	2.5686	22 40 19.2	6.698	1	20 53 7.02	2.3377	14 43 47.4	12.586
2	18 57 41.03	2.5630	22 33 32.6	6.853	2	20 55 27.13	2.3327	14 31 9.7	12.670
3	19 0 14.70	2.5594	22 26 36.8	7.007	3	20 57 46.94	2.3278	14 18 27.0	12.753
4	19 2 48.16	2.5558	22 19 31.8	7.159	4	21 0 6.46	2.3228	14 5 39.3	12.834
5	19 5 21.39	2.5520	22 12 17.7	7.311	5	21 2 25.67	2.3178	13 52 46.9	12.913
6	19 7 54.40	2.5482	22 4 54.5	7.462	6	21 4 44.59	2.3129	13 39 49.7	12.992
7	19 10 27.17	2.5441	21 57 22.3	7.611	7	21 7 3.22	2.3081	13 26 47.9	13.068
8	19 12 59.69	2.5401	21 49 41.2	7.759	8	21 9 21.56	2.3033	13 13 41.6	13.143
9	19 15 31.98	2.5360	21 41 51.2	7.906	9	21 11 39.61	2.2985	13 0 30.8	13.216
10	19 18 4.01	2.5318	21 33 52.5	8.051	10	21 13 57.38	2.2938	12 47 15.7	13.287
11	19 20 35.79	2.5274	21 25 45.1	8.196	11	21 16 14.86	2.2891	12 33 56.4	13.356
12	19 23 7.30	2.5230	21 17 29.1	8.338	12	21 18 52.07	2.2845	12 20 33.0	13.423
13	19 25 38.55	2.5187	21 9 4.5	8.480	13	21 20 49.00	2.2798	12 7 5.6	13.490
14	19 28 9.54	2.5142	21 0 31.5	8.621	14	21 23 5.65	2.2752	11 53 34.2	13.555
15	19 30 40.25	2.5096	20 51 50.0	8.760	15	21 25 22.02	2.2707	11 39 59.0	13.618
16	19 33 10.69	2.5050	20 43 0.3	8.897	16	21 27 38.13	2.2663	11 26 20.0	13.680
17	19 35 40.85	2.5004	20 34 2.4	9.033	17	21 29 53.98	2.2619	11 12 37.4	13.739
18	19 38 10.74	2.4967	20 24 56.3	9.168	18	21 32 9.56	2.2575	10 58 51.3	13.798
19	19 40 40.33	2.4930	20 15 42.2	9.302	19	21 34 24.88	2.2532	10 45 1.6	13.855
20	19 43 9.64	2.4880	20 6 20.1	9.434	20	21 36 39.94	2.2490	10 31 8.7	13.909
21	19 45 38.65	2.4812	19 56 50.1	9.564	21	21 38 54.76	2.2448	10 17 12.5	13.963
22	19 48 7.38	2.4763	19 47 12.4	9.693	22	21 41 9.32	2.2406	10 3 13.1	14.016
23	19 50 35.81	2.4713	19 37 26.9	9.821	23	21 43 23.63	2.2366	9 49 10.6	14.066
24	19 53 3.94	2.4663	-19 27 33.9	+9.947	24	21 45 37.71	2.2327	- 9 35 5.2	+14.114

MOON, 1917.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 10.					JUNE 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 45 37.71	2.2327	-9 35 5.2	+14.114	0	23 29 27.87	2.1219	+ 2 10 22.6	+14.738
1	21 47 51.55	2.2287	9 20 56.9	14.162	1	23 31 35.17	2.1213	2 25 6.3	14.718
2	21 50 5.15	2.2248	9 6 45.8	14.208	2	23 33 42.43	2.1209	2 39 48.7	14.696
3	21 52 18.52	2.2209	8 52 32.0	14.252	3	23 35 49.68	2.1206	2 54 29.8	14.673
4	21 54 31.66	2.2172	8 38 15.6	14.294	4	23 37 56.90	2.1203	3 9 9.4	14.648
5	21 56 44.58	2.2135	8 23 56.7	14.336	5	23 40 4.11	2.1201	3 23 47.6	14.623
6	21 58 57.28	2.2098	8 9 35.3	14.376	6	23 42 11.31	2.1199	3 38 24.2	14.597
7	22 1 9.76	2.2063	7 55 11.6	14.413	7	23 44 18.50	2.1198	3 52 59.2	14.569
8	22 3 22.03	2.2028	7 40 45.7	14.449	8	23 46 25.69	2.1199	4 7 32.5	14.540
9	22 5 34.09	2.1993	7 26 17.7	14.484	9	23 48 32.89	2.1200	4 22 4.0	14.509
10	22 7 45.95	2.1959	7 11 47.6	14.518	10	23 50 40.09	2.1201	4 36 33.6	14.478
11	22 9 57.60	2.1926	6 57 15.5	14.550	11	23 52 47.30	2.1203	4 51 1.4	14.445
12	22 12 9.06	2.1894	6 42 41.6	14.580	12	23 54 54.52	2.1206	5 5 27.0	14.410
13	22 14 20.33	2.1863	6 28 5.9	14.609	13	23 57 1.77	2.1210	5 19 50.6	14.376
14	22 16 31.42	2.1833	6 13 28.5	14.637	14	23 59 9.04	2.1213	5 34 12.1	14.339
15	22 18 42.32	2.1802	5 58 49.5	14.663	15	0 1 16.33	2.1218	5 48 31.3	14.301
16	22 20 53.04	2.1772	5 44 8.9	14.688	16	0 3 23.66	2.1225	6 2 48.2	14.263
17	22 23 3.58	2.1742	5 29 26.9	14.711	17	0 5 31.03	2.1231	6 17 2.8	14.223
18	22 25 13.96	2.1716	5 14 43.6	14.732	18	0 7 38.43	2.1237	6 31 14.9	14.181
19	22 27 24.17	2.1688	4 59 59.1	14.753	19	0 9 45.87	2.1246	6 45 24.5	14.139
20	22 29 34.22	2.1661	4 45 13.3	14.772	20	0 11 53.37	2.1253	6 59 31.6	14.095
21	22 31 44.10	2.1635	4 30 26.5	14.788	21	0 14 0.91	2.1263	7 13 35.9	14.050
22	22 33 53.84	2.1611	4 15 38.7	14.806	22	0 16 8.51	2.1272	7 27 37.6	14.005
23	22 36 3.43	2.1585	-4 0 49.9	+14.819	23	0 18 16.16	2.1281	+ 7 41 36.5	+13.967
JUNE 11.					JUNE 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 38 12.86	2.1561	-3 46 0.4	+14.832	0	0 20 23.88	2.1293	+ 7 55 32.4	+13.908
1	22 40 22.16	2.1539	3 31 10.1	14.843	1	0 22 31.67	2.1303	8 9 25.5	13.859
2	22 42 31.33	2.1518	3 16 19.2	14.853	2	0 24 39.52	2.1315	8 23 15.5	13.808
3	22 44 40.37	2.1496	3 1 27.7	14.863	3	0 26 47.45	2.1328	8 37 2.4	13.756
4	22 46 49.28	2.1475	2 46 35.7	14.871	4	0 28 55.45	2.1341	8 50 46.2	13.703
5	22 48 58.07	2.1455	2 31 43.2	14.877	5	0 31 3.54	2.1355	9 4 26.8	13.649
6	22 51 6.74	2.1436	2 16 50.5	14.881	6	0 33 11.71	2.1368	9 18 4.1	13.593
7	22 53 15.30	2.1418	2 1 57.5	14.885	7	0 35 19.96	2.1383	9 31 38.0	13.536
8	22 55 23.75	2.1399	1 47 4.3	14.887	8	0 37 28.31	2.1399	9 45 8.4	13.478
9	22 57 32.09	2.1383	1 32 11.1	14.887	9	0 39 36.75	2.1415	9 58 35.4	13.420
10	22 59 40.34	2.1367	1 17 17.9	14.887	10	0 41 45.29	2.1431	10 11 58.8	13.360
11	23 1 48.49	2.1351	1 2 24.7	14.885	11	0 43 53.92	2.1448	10 25 18.6	13.298
12	23 3 56.55	2.1337	0 47 31.7	14.881	12	0 46 2.66	2.1466	10 38 34.6	13.236
13	23 6 4.53	2.1323	0 32 39.0	14.877	13	0 48 11.51	2.1484	10 51 46.9	13.173
14	23 8 12.42	2.1309	0 17 46.5	14.871	14	0 50 20.47	2.1502	11 4 55.3	13.108
15	23 10 20.24	2.1297	-0 2 54.5	14.863	15	0 52 29.53	2.1521	11 17 59.8	13.042
16	23 12 27.98	2.1285	+0 11 57.0	14.854	16	0 54 38.72	2.1541	11 31 0.3	12.975
17	23 14 35.66	2.1274	0 26 48.0	14.844	17	0 56 48.02	2.1561	11 43 56.8	12.907
18	23 16 43.27	2.1264	0 41 38.3	14.833	18	0 58 57.45	2.1582	11 56 49.1	12.838
19	23 18 50.83	2.1254	0 56 28.0	14.821	19	1 1 7.00	2.1603	12 9 37.3	12.768
20	23 20 58.32	2.1245	1 11 16.8	14.806	20	1 3 16.68	2.1623	12 22 21.2	12.696
21	23 23 5.77	2.1238	1 26 4.7	14.791	21	1 5 26.48	2.1645	12 35 0.7	12.623
22	23 25 13.18	2.1231	1 40 51.7	14.775	22	1 7 36.42	2.1668	12 47 35.9	12.549
23	23 27 20.54	2.1224	1 55 37.7	14.758	23	1 9 46.49	2.1690	13 0 6.6	12.475
24	23 29 27.87	2.1219	+2 10 22.6	+14.738	24	1 11 56.70	2.1713	+13 12 32.9	+12.399

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
JUNE 14.									JUNE 16.								
	h	m	s		°	'	"			h	m	s		°	'	"	
0	1	11	56.70	2.1713	+13	12	32.9	+12.309	0	2	59	14.14	2.3008	+21	20	20.6	+7.555
1	1	14	7.05	2.1737	13	24	54.5	12.322	1	3	1	32.23	2.3027	21	27	50.2	7.433
2	1	16	17.54	2.1760	13	37	11.5	12.244	2	3	3	50.46	2.3050	21	35	12.5	7.309
3	1	18	28.17	2.1784	13	49	23.8	12.164	3	3	6	8.83	2.3074	21	42	27.3	7.184
4	1	20	38.95	2.1808	14	1	31.2	12.083	4	3	8	27.35	2.3097	21	49	34.6	7.059
5	1	22	49.87	2.1833	14	13	33.8	12.008	5	3	10	45.99	2.3119	21	56	34.4	6.933
6	1	25	0.95	2.1859	14	25	31.5	11.920	6	3	13	4.78	2.3142	22	3	26.6	6.806
7	1	27	12.18	2.1884	14	37	24.2	11.837	7	3	15	23.69	2.3163	22	10	11.8	6.681
8	1	29	23.56	2.1910	14	49	11.9	11.752	8	3	17	42.73	2.3183	22	16	48.3	6.553
9	1	31	35.10	2.1936	15	0	54.4	11.666	9	3	20	1.89	2.3204	22	23	17.7	6.426
10	1	33	46.79	2.1962	15	12	31.8	11.579	10	3	22	21.18	2.3224	22	29	39.4	6.297
11	1	35	58.64	2.1988	15	24	3.9	11.491	11	3	24	40.58	2.3243	22	35	53.3	6.167
12	1	38	10.65	2.2015	15	35	30.7	11.403	12	3	27	0.10	2.3263	22	41	59.4	6.037
13	1	40	22.82	2.2043	15	46	52.2	11.313	13	3	29	19.73	2.3281	22	47	57.7	5.907
14	1	42	35.16	2.2070	15	58	8.2	11.222	14	3	31	39.47	2.3299	22	53	48.2	5.775
15	1	44	47.66	2.2097	16	9	18.8	11.130	15	3	33	59.32	2.3316	22	59	30.7	5.643
16	1	47	0.32	2.2124	16	20	23.8	11.036	16	3	36	19.26	2.3333	23	5	5.4	5.512
17	1	49	13.15	2.2153	16	31	23.1	10.943	17	3	38	39.30	2.3348	23	10	32.1	5.379
18	1	51	26.15	2.2180	16	42	16.9	10.848	18	3	40	59.44	2.3363	23	15	50.9	5.246
19	1	53	39.31	2.2206	16	53	4.8	10.751	19	3	43	19.66	2.3378	23	21	1.6	5.112
20	1	55	52.64	2.2236	17	3	47.0	10.654	20	3	45	39.97	2.3392	23	26	4.3	4.978
21	1	58	6.14	2.2263	17	14	23.3	10.556	21	3	48	0.36	2.3405	23	30	59.0	4.844
22	2	0	19.81	2.2292	17	24	53.7	10.457	22	3	50	20.83	2.3418	23	35	45.6	4.709
23	2	2	33.65	2.2320	+17	35	18.1	+10.367	23	3	52	41.37	2.3429	+23	40	24.1	+4.574
JUNE 15.									JUNE 17.								
0	2	4	47.65	2.2348	+17	45	36.5	+10.256	0	3	55	1.98	2.3440	+23	44	54.5	+4.438
1	2	7	1.83	2.2378	17	55	48.8	10.153	1	3	57	22.65	2.3451	23	49	16.7	4.308
2	2	9	16.18	2.2406	18	5	54.9	10.050	2	3	59	43.39	2.3461	23	53	30.8	4.167
3	2	11	30.70	2.2434	18	15	54.8	9.946	3	4	2	4.18	2.3468	23	57	36.7	4.030
4	2	13	45.39	2.2463	18	25	48.4	9.842	4	4	4	25.01	2.3477	24	1	34.4	3.893
5	2	16	0.25	2.2492	18	35	35.8	9.736	5	4	6	45.90	2.3484	24	5	23.9	3.757
6	2	18	15.29	2.2520	18	45	16.7	9.628	6	4	9	6.82	2.3490	24	9	5.2	3.619
7	2	20	30.49	2.2548	18	54	51.2	9.521	7	4	11	27.78	2.3497	24	12	38.2	3.481
8	2	22	45.86	2.2576	19	4	19.2	9.412	8	4	13	48.78	2.3502	24	16	2.9	3.343
9	2	25	1.40	2.2604	19	13	40.6	9.302	9	4	16	9.80	2.3506	24	19	19.4	3.206
10	2	27	17.11	2.2633	19	22	55.4	9.192	10	4	18	30.84	2.3508	24	22	27.6	3.068
11	2	29	32.99	2.2661	19	32	3.6	9.081	11	4	20	51.89	2.3510	24	25	27.5	2.929
12	2	31	49.04	2.2688	19	41	5.1	8.968	12	4	23	12.96	2.3512	24	28	19.1	2.791
13	2	34	5.25	2.2716	19	49	59.8	8.855	13	4	25	34.03	2.3513	24	31	2.4	2.653
14	2	36	21.63	2.2743	19	58	47.7	8.741	14	4	27	55.11	2.3513	24	33	37.4	2.513
15	2	38	38.17	2.2770	20	7	28.7	8.626	15	4	30	16.18	2.3512	24	36	4.0	2.374
16	2	40	54.87	2.2798	20	16	2.8	8.510	16	4	32	37.25	2.3510	24	38	22.3	2.236
17	2	43	11.74	2.2824	20	24	29.9	8.393	17	4	34	58.30	2.3507	24	40	32.3	2.096
18	2	45	28.76	2.2850	20	32	50.0	8.277	18	4	37	19.33	2.3503	24	42	34.0	1.959
19	2	47	45.94	2.2877	20	41	3.1	8.158	19	4	39	40.34	2.3499	24	44	27.4	1.820
20	2	50	3.28	2.2903	20	49	9.0	8.039	20	4	42	1.32	2.3493	24	46	12.4	1.681
21	2	52	20.77	2.2928	20	57	7.8	7.919	21	4	44	22.26	2.3487	24	47	49.1	1.543
22	2	54	38.41	2.2953	21	4	59.3	7.798	22	4	46	43.16	2.3480	24	49	17.6	1.405
23	2	56	56.20	2.2978	21	12	43.6	7.678	23	4	49	4.02	2.3473	24	50	37.7	1.266
24	2	59	14.14	2.3003	+21	20	20.6	+7.555	24	4	51	24.83	2.3463	+24	51	49.5	+1.128

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 18.					JUNE 20.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	4 51 24.83	2.3463	+24 51 49.5	+1.128	0	6 41 27.34	2.2114	+23 12 59.4	-5.035
1	4 53 45.58	2.3453	24 52 53.0	0.988	1	6 43 39.90	2.2072	23 7 53.9	5.148
2	4 56 6.27	2.3443	24 53 48.1	0.850	2	6 45 52.20	2.2028	23 2 41.7	5.259
3	4 58 26.89	2.3432	24 54 35.0	0.713	3	6 48 4.24	2.1985	22 57 22.8	5.370
4	5 0 47.45	2.3419	24 55 13.7	0.575	4	6 50 16.02	2.1941	22 51 57.3	5.479
5	5 3 7.92	2.3405	24 55 44.0	0.437	5	6 52 27.53	2.1897	22 46 25.3	5.588
6	5 5 28.31	2.3392	24 56 6.1	0.300	6	6 54 38.78	2.1852	22 40 46.7	5.696
7	5 7 48.62	2.3377	24 56 20.0	0.163	7	6 56 49.75	2.1807	22 35 1.8	5.803
8	5 10 8.83	2.3361	24 56 25.7	+0.026	8	6 59 0.46	2.1763	22 29 10.4	5.910
9	5 12 28.95	2.3344	24 56 23.1	-0.111	9	7 1 10.90	2.1717	22 23 12.6	6.015
10	5 14 48.96	2.3327	24 56 12.4	0.247	10	7 3 21.06	2.1670	22 17 8.6	6.118
11	5 17 8.87	2.3308	24 55 53.5	0.383	11	7 5 30.94	2.1624	22 10 58.4	6.223
12	5 19 28.66	2.3288	24 55 26.5	0.518	12	7 7 40.55	2.1578	22 4 41.9	6.326
13	5 21 48.33	2.3268	24 54 51.3	0.653	13	7 9 49.88	2.1533	21 58 19.3	6.427
14	5 24 7.88	2.3248	24 54 8.1	0.788	14	7 11 58.94	2.1486	21 51 50.7	6.528
15	5 26 27.80	2.3226	24 53 16.7	0.923	15	7 14 7.71	2.1439	21 45 16.0	6.628
16	5 28 46.59	2.3203	24 52 17.3	1.057	16	7 16 16.21	2.1393	21 38 35.4	6.726
17	5 31 5.74	2.3180	24 51 9.9	1.190	17	7 18 24.42	2.1345	21 31 48.9	6.824
18	5 33 24.75	2.3156	24 49 54.5	1.323	18	7 20 32.35	2.1298	21 24 56.5	6.922
19	5 35 43.61	2.3131	24 48 31.1	1.457	19	7 22 40.00	2.1252	21 17 58.3	7.018
20	5 38 2.32	2.3106	24 46 59.7	1.588	20	7 24 47.37	2.1204	21 10 54.3	7.113
21	5 40 20.87	2.3078	24 45 20.5	1.720	21	7 26 54.45	2.1157	21 3 44.7	7.207
22	5 42 39.26	2.3051	24 43 33.3	1.852	22	7 29 1.25	2.1110	20 56 29.5	7.301
23	5 44 57.48	2.3023	+24 41 38.3	-1.982	23	7 31 7.77	2.1063	+20 49 8.6	-7.393
JUNE 19.					JUNE 21.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	5 47 15.54	2.2995	+24 39 35.5	-2.112	0	7 33 14.00	2.1015	+20 41 42.3	-7.484
1	5 49 33.42	2.2965	24 37 24.9	2.242	1	7 35 19.95	2.0968	20 34 10.5	7.575
2	5 51 51.12	2.2935	24 35 6.5	2.372	2	7 37 25.61	2.0920	20 26 33.3	7.665
3	5 54 8.64	2.2904	24 32 40.3	2.500	3	7 39 30.99	2.0873	20 18 50.7	7.754
4	5 56 25.97	2.2872	24 30 6.5	2.627	4	7 41 36.08	2.0826	20 11 2.8	7.842
5	5 58 43.10	2.2839	24 27 25.1	2.754	5	7 43 40.90	2.0778	20 3 9.7	7.928
6	6 1 0.04	2.2807	24 24 36.0	2.881	6	7 45 45.42	2.0731	19 55 11.5	8.014
7	6 3 16.78	2.2773	24 21 39.4	3.007	7	7 47 49.67	2.0684	19 47 8.0	8.100
8	6 5 33.32	2.2739	24 18 35.2	3.132	8	7 49 53.63	2.0637	19 38 59.5	8.183
9	6 7 49.65	2.2704	24 15 23.6	3.256	9	7 51 57.31	2.0590	19 30 46.0	8.267
10	6 10 5.77	2.2668	24 12 4.5	3.380	10	7 54 0.71	2.0543	19 22 27.5	8.348
11	6 12 21.67	2.2632	24 8 38.0	3.503	11	7 56 3.83	2.0496	19 14 4.2	8.429
12	6 14 37.35	2.2595	24 5 4.1	3.626	12	7 58 6.66	2.0449	19 5 36.0	8.510
13	6 16 52.81	2.2558	24 1 22.9	3.748	13	8 0 9.22	2.0403	18 57 3.0	8.590
14	6 19 8.05	2.2521	23 57 34.4	3.868	14	8 2 11.50	2.0357	18 48 25.2	8.669
15	6 21 23.06	2.2483	23 53 38.7	3.988	15	8 4 13.50	2.0311	18 39 42.7	8.746
16	6 23 37.84	2.2443	23 49 35.8	4.108	16	8 6 15.23	2.0265	18 30 55.7	8.823
17	6 25 52.38	2.2403	23 45 25.8	4.226	17	8 8 16.68	2.0220	18 22 4.0	8.899
18	6 28 6.68	2.2364	23 41 8.7	4.344	18	8 10 17.87	2.0174	18 13 7.8	8.974
19	6 30 20.75	2.2324	23 36 44.5	4.462	19	8 12 18.77	2.0128	18 4 7.1	9.048
20	6 32 34.57	2.2283	23 32 13.3	4.578	20	8 14 19.41	2.0084	17 55 2.1	9.121
21	6 34 48.14	2.2241	23 27 35.1	4.694	21	8 16 19.78	2.0040	17 45 52.6	9.193
22	6 37 1.46	2.2199	23 22 50.0	4.808	22	8 18 19.89	1.9995	17 36 38.9	9.264
23	6 39 14.53	2.2157	23 17 58.1	4.922	23	8 20 19.72	1.9951	17 27 20.9	9.334
24	6 41 27.34	2.2114	+23 12 59.4	-5.035	24	8 22 19.30	1.9908	+17 17 58.8	-9.403

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 22.					JUNE 24.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	8 22 19.30	1.9908	+17 17 58.8	-9.403	0	9 53 33.71	1.8293	+8 42 23.7	-11.778
1	8 24 18.61	1.9863	17 8 32.5	-9.473	1	9 55 23.40	1.8272	8 30 36.1	11.809
2	8 26 17.66	1.9820	16 59 2.1	-9.541	2	9 57 12.97	1.8251	8 18 46.6	11.840
3	8 28 16.45	1.9778	16 49 27.6	-9.608	3	9 59 2.41	1.8231	8 6 55.3	11.869
4	8 30 14.99	1.9734	16 39 49.2	-9.673	4	10 0 51.74	1.8213	7 55 2.3	11.898
5	8 32 13.26	1.9692	16 30 6.8	-9.738	5	10 2 40.96	1.8198	7 43 7.5	11.928
6	8 34 11.29	1.9651	16 20 20.6	-9.803	6	10 4 30.06	1.8176	7 31 11.0	11.955
7	8 36 9.07	1.9609	16 10 30.5	-9.867	7	10 6 19.07	1.8159	7 19 12.9	11.983
8	8 38 6.60	1.9568	16 0 36.6	-9.929	8	10 8 7.97	1.8142	7 7 13.1	12.009
9	8 40 3.88	1.9526	15 50 39.0	-9.991	9	10 9 56.77	1.8126	6 55 11.8	12.034
10	8 42 0.91	1.9486	15 40 37.7	-10.052	10	10 11 45.48	1.8111	6 43 9.0	12.060
11	8 43 57.71	1.9447	15 30 32.8	-10.112	11	10 13 34.10	1.8096	6 31 4.6	12.085
12	8 45 54.27	1.9407	15 20 24.3	-10.171	12	10 15 22.63	1.8082	6 18 58.8	12.108
13	8 47 50.59	1.9367	15 10 12.3	-10.229	13	10 17 11.08	1.8068	6 6 51.6	12.132
14	8 49 46.67	1.9328	14 59 56.8	-10.287	14	10 18 59.45	1.8055	5 54 43.0	12.154
15	8 51 42.52	1.9289	14 49 37.9	-10.343	15	10 20 47.74	1.8043	5 42 33.1	12.176
16	8 53 38.14	1.9251	14 39 15.7	-10.398	16	10 22 35.97	1.8032	5 30 21.9	12.198
17	8 55 33.53	1.9213	14 28 50.1	-10.454	17	10 24 24.12	1.8020	5 18 9.4	12.218
18	8 57 28.70	1.9177	14 18 21.2	-10.508	18	10 26 12.21	1.8011	5 5 55.7	12.238
19	8 59 23.65	1.9140	14 7 49.1	-10.562	19	10 28 0.25	1.8001	4 53 40.8	12.258
20	9 1 18.38	1.9103	13 57 13.8	-10.614	20	10 29 48.22	1.7991	4 41 24.7	12.277
21	9 3 12.89	1.9067	13 46 35.4	-10.666	21	10 31 36.14	1.7983	4 29 7.6	12.295
22	9 5 7.18	1.9032	13 35 53.9	-10.718	22	10 33 24.02	1.7975	4 16 49.3	12.313
23	9 7 1.27	1.8998	+13 25 9.3	-10.767	23	10 35 11.84	1.7968	+4 4 30.0	12.329
JUNE 23.					JUNE 25.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	9 8 55.15	1.8963	+13 14 21.9	-10.815	0	10 36 59.63	1.7962	+3 52 9.8	-12.345
1	9 10 48.82	1.8928	13 3 31.5	-10.865	1	10 38 47.38	1.7956	3 39 48.6	-12.362
2	9 12 42.29	1.8895	12 52 38.1	-10.913	2	10 40 35.10	1.7951	3 27 26.4	-12.377
3	9 14 35.56	1.8863	12 41 41.9	-10.959	3	10 42 22.79	1.7947	3 15 3.4	-12.391
4	9 16 28.64	1.8830	12 30 43.0	-11.006	4	10 44 10.46	1.7943	3 2 39.5	-12.406
5	9 18 21.52	1.8798	12 19 41.2	-11.052	5	10 45 58.11	1.7940	2 50 14.7	-12.419
6	9 20 14.21	1.8766	12 8 36.8	-11.097	6	10 47 45.74	1.7937	2 37 49.2	-12.431
7	9 22 6.71	1.8735	11 57 29.6	-11.141	7	10 49 33.35	1.7935	2 25 23.0	-12.443
8	9 23 59.03	1.8705	11 46 19.9	-11.183	8	10 51 20.96	1.7934	2 12 56.0	-12.455
9	9 25 51.17	1.8675	11 35 7.6	-11.226	9	10 53 8.56	1.7934	2 0 28.4	-12.466
10	9 27 43.13	1.8645	11 23 52.8	-11.268	10	10 54 56.17	1.7934	1 48 0.1	-12.476
11	9 29 34.91	1.8616	11 12 35.5	-11.309	11	10 56 43.77	1.7935	1 35 31.3	-12.486
12	9 31 26.52	1.8588	11 1 15.7	-11.350	12	10 58 31.39	1.7936	1 23 1.8	-12.496
13	9 33 17.97	1.8561	10 49 53.5	-11.389	13	11 0 19.02	1.7939	1 10 31.9	-12.508
14	9 35 9.25	1.8533	10 38 29.0	-11.428	14	11 2 6.66	1.7942	0 58 1.5	-12.511
15	9 37 0.36	1.8506	10 27 2.2	-11.466	15	11 3 54.32	1.7945	0 45 30.6	-12.518
16	9 38 51.32	1.8481	10 15 33.1	-11.503	16	11 5 42.00	1.7950	0 32 59.4	-12.524
17	9 40 42.13	1.8455	10 4 1.8	-11.540	17	11 7 29.72	1.7955	0 20 27.7	-12.530
18	9 42 32.78	1.8430	9 52 28.8	-11.577	18	11 9 17.46	1.7961	+0 7 55.8	-12.538
19	9 44 23.29	1.8406	9 40 52.6	-11.613	19	11 11 5.25	1.7968	-0 4 36.5	-12.540
20	9 46 13.65	1.8382	9 29 14.8	-11.647	20	11 12 53.07	1.7974	0 17 9.0	-12.543
21	9 48 3.87	1.8358	9 17 35.0	-11.680	21	11 14 40.94	1.7982	0 29 41.7	-12.547
22	9 49 53.95	1.8335	9 5 53.2	-11.713	22	11 16 28.85	1.7991	0 42 14.6	-12.550
23	9 51 43.89	1.8313	8 54 9.4	-11.746	23	11 18 16.83	1.8000	0 54 47.7	-12.552
24	9 53 33.71	1.8293	+8 42 23.7	-11.778	24	11 20 4.85	1.8009	-1 7 20.8	-12.553

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 26.					JUNE 28.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	11 20 4.85	1.8009	- 1 7 20.8	-12.553	0	12 49 0.97	1.9323	-10 58 53.2	-11.813
1	11 21 52.94	1.8020	1 19 54.0	12.554	1	12 50 57.04	1.9368	11 10 40.9	11.778
2	11 23 41.09	1.8032	1 32 27.3	12.554	2	12 52 53.38	1.9413	11 22 26.5	11.743
3	11 25 29.32	1.8043	1 45 0.5	12.553	3	12 54 49.99	1.9458	11 34 10.0	11.708
4	11 27 17.61	1.8056	1 57 33.7	12.553	4	12 56 46.88	1.9506	11 45 51.2	11.668
5	11 29 5.99	1.8070	2 10 6.9	12.552	5	12 58 44.06	1.9554	11 57 30.2	11.630
6	11 30 54.45	1.8083	2 22 39.9	12.549	6	13 0 41.53	1.9602	12 9 6.8	11.590
7	11 32 42.99	1.8098	2 35 12.8	12.547	7	13 2 39.28	1.9650	12 20 41.0	11.550
8	11 34 31.63	1.8114	2 47 45.5	12.543	8	13 4 37.33	1.9700	12 32 12.8	11.509
9	11 36 20.36	1.8129	3 0 17.9	12.538	9	13 6 35.68	1.9751	12 43 42.1	11.467
10	11 38 9.18	1.8147	3 12 50.1	12.534	10	13 8 34.34	1.9802	12 55 8.8	11.423
11	11 39 58.12	1.8165	3 25 22.0	12.528	11	13 10 33.90	1.9853	13 6 32.9	11.378
12	11 41 47.16	1.8183	3 37 53.5	12.522	12	13 12 32.58	1.9906	13 17 54.2	11.333
13	11 43 36.31	1.8203	3 50 24.6	12.515	13	13 14 32.17	1.9958	13 29 12.8	11.288
14	11 45 25.59	1.8223	4 2 55.3	12.508	14	13 16 32.08	2.0013	13 40 28.7	11.240
15	11 47 14.98	1.8242	4 15 25.5	12.499	15	13 18 32.32	2.0067	13 51 41.6	11.192
16	11 49 4.49	1.8263	4 27 55.2	12.490	16	13 20 32.88	2.0121	14 2 51.7	11.143
17	11 50 54.14	1.8286	4 40 24.3	12.480	17	13 22 33.77	2.0177	14 13 58.7	11.092
18	11 52 43.92	1.8308	4 52 52.8	12.470	18	13 24 35.00	2.0233	14 25 2.7	11.040
19	11 54 33.84	1.8332	5 5 20.7	12.459	19	13 26 36.57	2.0289	14 36 3.5	10.988
20	11 56 23.90	1.8355	5 17 47.9	12.448	20	13 28 38.47	2.0347	14 47 1.2	10.934
21	11 58 14.10	1.8380	5 30 14.4	12.435	21	13 30 40.73	2.0405	14 57 55.6	10.879
22	12 0 4.46	1.8407	5 42 40.1	12.422	22	13 32 43.33	2.0468	15 8 46.7	10.823
23	12 1 54.98	1.8433	- 5 55 5.0	-12.408	23	13 34 46.29	2.0528	-15 19 34.4	-10.767
JUNE 27.					JUNE 29.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	12 3 45.65	1.8459	- 6 7 29.0	-12.393	0	13 36 49.60	2.0582	-15 30 18.7	-10.708
1	12 5 36.49	1.8487	6 19 52.2	12.378	1	13 38 53.27	2.0642	15 40 59.4	10.648
2	12 7 27.49	1.8515	6 32 14.4	12.363	2	13 40 57.30	2.0703	15 51 36.5	10.588
3	12 9 18.67	1.8545	6 44 35.7	12.346	3	13 43 1.70	2.0764	16 2 10.0	10.527
4	12 11 10.03	1.8574	6 56 55.9	12.328	4	13 45 6.47	2.0827	16 12 39.7	10.463
5	12 13 1.56	1.8605	7 9 15.1	12.310	5	13 47 11.62	2.0889	16 23 5.6	10.400
6	12 14 53.29	1.8637	7 21 33.1	12.291	6	13 49 17.14	2.0952	16 33 27.7	10.335
7	12 16 45.20	1.8668	7 33 50.0	12.272	7	13 51 23.04	2.1015	16 43 45.8	10.268
8	12 18 37.31	1.8702	7 46 5.7	12.252	8	13 53 29.32	2.1078	16 53 59.8	10.200
9	12 20 29.61	1.8735	7 58 20.2	12.230	9	13 55 35.98	2.1143	17 4 9.8	10.133
10	12 22 22.12	1.8769	8 10 33.3	12.208	10	13 57 43.04	2.1206	17 14 15.7	10.062
11	12 24 14.84	1.8804	8 22 45.1	12.184	11	13 59 50.48	2.1273	17 24 17.2	9.990
12	12 26 7.77	1.8840	8 34 55.4	12.160	12	14 1 58.32	2.1339	17 34 14.5	9.918
13	12 28 0.92	1.8876	8 47 4.3	12.137	13	14 4 6.55	2.1405	17 44 7.4	9.844
14	12 29 54.28	1.8913	8 59 11.8	12.112	14	14 6 15.18	2.1473	17 53 55.8	9.768
15	12 31 47.87	1.8951	9 11 17.7	12.085	15	14 8 24.22	2.1539	18 3 39.6	9.692
16	12 33 41.69	1.8989	9 23 22.0	12.058	16	14 10 33.65	2.1607	18 13 18.8	9.614
17	12 35 35.74	1.9028	9 35 24.7	12.030	17	14 12 43.50	2.1675	18 22 53.3	9.536
18	12 37 30.03	1.9068	9 47 25.6	12.002	18	14 14 53.75	2.1743	18 32 23.1	9.455
19	12 39 24.56	1.9108	9 59 24.9	11.973	19	14 17 4.41	2.1811	18 41 47.9	9.373
20	12 41 19.33	1.9149	10 11 22.3	11.942	20	14 19 15.48	2.1879	18 51 7.9	9.291
21	12 43 14.35	1.9192	10 23 17.9	11.912	21	14 21 26.96	2.1949	19 0 22.8	9.206
22	12 45 9.63	1.9235	10 35 11.7	11.879	22	14 23 38.87	2.2019	19 9 32.6	9.120
23	12 47 5.17	1.9278	10 47 3.4	11.846	23	14 25 51.19	2.2088	19 18 37.2	9.033
24	12 49 0.97	1.9323	-10 58 53.2	-11.813	24	14 28 3.92	2.2158	-19 27 36.6	-8.945

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 30.					JULY 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 28 3.92	2.2158	-19 27 36.6	-8.945	0	16 22 26.28	2.5304	-24 28 17.2	-3.048
1	14 30 17.08	2.2228	19 36 30.6	8.855	1	16 24 58.63	2.5417	24 31 15.4	2.803
2	14 32 30.66	2.2298	19 45 19.2	8.764	2	16 27 31.28	2.5488	24 34 4.3	2.736
3	14 34 44.66	2.2369	19 54 2.3	8.673	3	16 30 4.25	2.5519	24 36 43.7	2.578
4	14 36 59.09	2.2440	20 2 39.8	8.578	4	16 32 37.51	2.5568	24 39 13.7	2.420
5	14 39 13.94	2.2511	20 11 11.6	8.483	5	16 35 11.07	2.5617	24 41 34.1	2.259
6	14 41 29.22	2.2583	20 19 37.7	8.386	6	16 37 44.91	2.5663	24 43 44.8	2.096
7	14 43 44.93	2.2654	20 27 57.9	8.288	7	16 40 19.03	2.5709	24 45 45.9	1.938
8	14 46 1.07	2.2725	20 36 12.2	8.188	8	16 42 53.42	2.5754	24 47 37.3	1.775
9	14 48 17.63	2.2796	20 44 20.4	8.087	9	16 45 28.08	2.5798	24 49 18.9	1.612
10	14 50 34.62	2.2868	20 52 22.6	7.984	10	16 48 2.99	2.5840	24 50 50.7	1.448
11	14 52 52.04	2.2939	21 0 18.5	7.880	11	16 50 38.16	2.5881	24 52 12.6	1.282
12	14 55 9.89	2.3011	21 8 8.2	7.775	12	16 53 13.56	2.5920	24 53 24.5	1.115
13	14 57 28.17	2.3083	21 15 51.5	7.668	13	16 55 49.20	2.5959	24 54 26.4	0.948
14	14 59 46.88	2.3155	21 23 28.4	7.561	14	16 58 25.07	2.5996	24 55 18.3	0.781
15	15 2 6.01	2.3225	21 30 58.8	7.451	15	17 1 1.15	2.6031	24 56 0.1	0.613
16	15 4 25.58	2.3297	21 38 22.5	7.339	16	17 3 37.44	2.6066	24 56 31.8	0.443
17	15 6 45.57	2.3368	21 45 39.5	7.227	17	17 6 13.94	2.6098	24 56 53.3	0.273
18	15 9 5.99	2.3438	21 52 49.7	7.113	18	17 8 50.62	2.6129	24 57 4.6	-0.103
19	15 11 26.83	2.3509	21 59 53.1	6.998	19	17 11 27.49	2.6160	24 57 5.6	+0.068
20	15 13 48.10	2.3580	22 6 49.4	6.881	20	17 14 4.54	2.6188	24 56 56.4	0.240
21	15 16 9.79	2.3650	22 13 38.8	6.763	21	17 16 41.75	2.6216	24 56 36.8	0.412
22	15 18 31.90	2.3721	22 20 20.9	6.643	22	17 19 19.13	2.6242	24 56 6.9	0.585
23	15 20 54.44	2.3790	-22 26 55.9	-6.523	23	17 21 56.65	2.6265	-24 55 26.6	+0.758
JULY 1.					JULY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 23 17.38	2.3859	-22 33 23.6	-6.400	0	17 24 34.31	2.6288	-24 54 35.9	+0.932
1	15 25 40.75	2.3930	22 39 43.9	6.276	1	17 27 12.11	2.6309	24 53 34.8	1.106
2	15 28 4.54	2.3998	22 45 56.7	6.150	2	17 29 50.02	2.6328	24 52 23.2	1.280
3	15 30 28.73	2.4067	22 52 1.9	6.023	3	17 32 28.05	2.6348	24 51 1.2	1.454
4	15 32 53.34	2.4135	22 57 59.4	5.894	4	17 35 6.19	2.6364	24 49 28.7	1.629
5	15 35 18.35	2.4203	23 3 49.2	5.765	5	17 37 44.42	2.6379	24 47 45.7	1.805
6	15 37 43.77	2.4270	23 9 31.2	5.634	6	17 40 22.74	2.6393	24 45 52.1	1.980
7	15 40 9.59	2.4337	23 15 5.3	5.502	7	17 43 1.13	2.6405	24 43 48.1	2.155
8	15 42 35.81	2.4403	23 20 31.4	5.368	8	17 45 39.60	2.6416	24 41 33.5	2.331
9	15 45 2.42	2.4468	23 25 49.4	5.233	9	17 48 18.12	2.6424	24 39 8.4	2.507
10	15 47 29.43	2.4533	23 30 59.3	5.096	10	17 50 56.69	2.6433	24 36 32.7	2.683
11	15 49 56.82	2.4598	23 36 0.9	4.958	11	17 53 35.31	2.6439	24 33 46.5	2.858
12	15 52 24.60	2.4662	23 40 54.3	4.819	12	17 56 13.96	2.6448	24 30 49.7	3.034
13	15 54 52.76	2.4725	23 45 39.2	4.678	13	17 58 52.63	2.6446	24 27 42.4	3.209
14	15 57 21.30	2.4787	23 50 15.7	4.537	14	18 1 31.31	2.6448	24 24 24.6	3.385
15	15 59 50.20	2.4848	23 54 43.6	4.398	15	18 4 10.00	2.6448	24 20 56.2	3.560
16	16 2 19.48	2.4910	23 59 2.9	4.248	16	18 6 48.68	2.6446	24 17 17.4	3.735
17	16 4 49.12	2.4969	24 3 13.4	4.103	17	18 9 27.35	2.6443	24 13 28.0	3.910
18	16 7 19.11	2.5028	24 7 15.2	3.956	18	18 12 6.00	2.6438	24 9 28.2	4.084
19	16 9 49.46	2.5087	24 11 8.1	3.808	19	18 14 44.61	2.6433	24 5 17.9	4.258
20	16 12 20.15	2.5144	24 14 52.1	3.658	20	18 17 23.19	2.6425	24 0 57.2	4.433
21	16 14 51.19	2.5201	24 18 27.1	3.508	21	18 20 1.71	2.6416	23 56 26.0	4.606
22	16 17 22.56	2.5256	24 21 53.0	3.355	22	18 22 40.18	2.6406	23 51 44.5	4.779
23	16 19 54.26	2.5310	24 25 9.7	3.202	23	18 25 18.58	2.6394	23 46 52.5	4.952
24	16 22 26.28	2.5364	-24 28 17.2	-3.048	24	18 27 56.91	2.6381	-23 41 50.3	+5.123

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 4.					JULY 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 27 56.91	2.6381	-23 41 50.3	+ 5.123	0	20 30 55.76	2.4559	-16 36 34.0	+12.078
1	18 30 35.15	2.6367	23 36 37.8	5.294	1	20 33 22.96	2.4508	16 24 26.1	12.186
2	18 33 13.31	2.6351	23 31 15.0	5.466	2	20 35 49.85	2.4456	16 12 11.7	12.292
3	18 35 51.36	2.6333	23 25 41.9	5.636	3	20 38 16.43	2.4405	15 59 51.1	12.395
4	18 38 29.30	2.6314	23 19 58.7	5.804	4	20 40 42.71	2.4353	15 47 24.3	12.497
5	18 41 7.13	2.6295	23 14 5.4	5.973	5	20 43 8.67	2.4302	15 34 51.5	12.597
6	18 43 44.84	2.6273	23 8 1.9	6.142	6	20 45 34.33	2.4251	15 22 12.7	12.695
7	18 46 22.41	2.6251	23 1 48.4	6.308	7	20 47 59.68	2.4199	15 9 28.1	12.792
8	18 48 59.85	2.6228	22 55 24.9	6.474	8	20 50 24.72	2.4148	14 56 37.7	12.886
9	18 51 37.14	2.6202	22 48 51.5	6.639	9	20 52 49.46	2.4097	14 43 41.8	12.978
10	18 54 14.27	2.6176	22 42 8.2	6.804	10	20 55 13.88	2.4047	14 30 40.3	13.069
11	18 56 51.25	2.6149	22 35 15.0	6.968	11	20 57 38.00	2.3995	14 17 33.5	13.158
12	18 59 28.06	2.6120	22 28 12.1	7.130	12	21 0 1.82	2.3944	14 4 21.4	13.245
13	19 2 4.69	2.6091	22 20 59.4	7.292	13	21 2 25.33	2.3893	13 51 4.1	13.330
14	19 4 41.15	2.6060	22 13 37.1	7.452	14	21 4 48.54	2.3843	13 37 41.8	13.413
15	19 7 17.41	2.6028	22 6 5.2	7.611	15	21 7 11.45	2.3793	13 24 14.6	13.494
16	19 9 53.48	2.5995	21 58 23.8	7.769	16	21 9 34.06	2.3743	13 10 42.5	13.574
17	19 12 29.35	2.5961	21 50 32.9	7.927	17	21 11 56.37	2.3693	12 57 5.7	13.651
18	19 15 5.01	2.5926	21 42 32.6	8.083	18	21 14 18.38	2.3644	12 43 24.4	13.727
19	19 17 40.46	2.5890	21 34 23.0	8.238	19	21 16 40.10	2.3595	12 29 38.5	13.802
20	19 20 15.69	2.5853	21 26 4.1	8.391	20	21 19 1.53	2.3546	12 15 48.2	13.873
21	19 22 50.70	2.5815	21 17 36.1	8.543	21	21 21 22.67	2.3496	12 1 53.7	13.943
22	19 25 25.47	2.5777	21 8 59.0	8.693	22	21 23 43.51	2.3445	11 47 55.0	14.012
23	19 28 0.02	2.5738	-21 0 12.9	+ 8.843	23	21 26 4.07	2.3403	-11 33 52.3	+14.078
JULY 5.					JULY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 30 34.32	2.5697	-20 51 17.8	+ 8.992	0	21 28 24.35	2.3357	-11 19 45.6	+14.143
1	19 33 8.38	2.5656	20 42 13.9	9.138	1	21 30 44.35	2.3309	11 5 35.1	14.205
2	19 35 42.19	2.5613	20 33 1.3	9.283	2	21 33 4.06	2.3263	10 51 21.0	14.266
3	19 38 15.74	2.5571	20 23 39.9	9.428	3	21 35 23.50	2.3218	10 37 3.2	14.326
4	19 40 49.04	2.5528	20 14 10.0	9.569	4	21 37 42.67	2.3173	10 22 41.9	14.383
5	19 43 22.08	2.5484	20 4 31.6	9.710	5	21 40 1.57	2.3128	10 8 17.3	14.438
6	19 45 54.85	2.5439	19 54 44.8	9.849	6	21 42 20.20	2.3083	9 53 49.4	14.492
7	19 48 27.35	2.5394	19 44 49.7	9.988	7	21 44 38.56	2.3038	9 39 18.3	14.543
8	19 50 59.58	2.5348	19 34 46.3	10.124	8	21 46 56.66	2.2995	9 24 44.2	14.593
9	19 53 31.53	2.5302	19 24 34.8	10.258	9	21 49 14.50	2.2953	9 10 7.1	14.641
10	19 56 3.20	2.5254	19 14 15.3	10.392	10	21 51 32.09	2.2910	8 55 27.3	14.687
11	19 58 34.58	2.5207	19 3 47.8	10.523	11	21 53 49.42	2.2868	8 40 44.7	14.733
12	20 1 5.68	2.5159	18 53 12.6	10.652	12	21 56 6.50	2.2827	8 25 59.4	14.775
13	20 3 36.49	2.5111	18 42 29.6	10.781	13	21 58 23.34	2.2787	8 11 11.7	14.815
14	20 6 7.01	2.5062	18 31 38.9	10.908	14	22 0 39.94	2.2747	7 56 21.6	14.854
15	20 8 37.23	2.5013	18 20 40.7	11.033	15	22 2 56.30	2.2707	7 41 29.2	14.892
16	20 11 7.16	2.4964	18 9 35.0	11.156	16	22 5 12.42	2.2668	7 26 34.6	14.928
17	20 13 36.80	2.4914	17 58 22.0	11.278	17	22 7 28.31	2.2629	7 11 37.9	14.961
18	20 16 6.13	2.4863	17 47 1.7	11.398	18	22 9 43.97	2.2592	6 56 39.3	14.993
19	20 18 35.16	2.4813	17 35 34.3	11.515	19	22 11 59.41	2.2555	6 41 38.8	15.023
20	20 21 3.89	2.4763	17 23 59.9	11.631	20	22 14 14.63	2.2518	6 26 36.5	15.052
21	20 23 32.31	2.4713	17 12 18.6	11.746	21	22 16 29.63	2.2483	6 11 32.6	15.078
22	20 26 0.44	2.4662	17 0 30.4	11.859	22	22 18 44.42	2.2447	5 56 27.1	15.104
23	20 28 28.25	2.4610	16 48 35.5	11.970	23	22 20 58.99	2.2412	5 41 20.1	15.128
24	20 30 55.76	2.4559	-16 36 34.0	+12.078	24	22 23 13.36	2.2378	- 5 26 11.8	+15.149

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 8.					JULY 10.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 23 13.36	2.2378	-5 26 11.8	+15.149	0	0 8 4.71	2.1584	+6 36 12.5	+14.394
1	22 25 27.53	2.2346	5 11 2.2	15.169	1	0 10 14.22	2.1584	6 50 34.7	14.344
2	22 27 41.51	2.2313	4 55 51.5	15.188	2	0 12 23.72	2.1585	7 4 53.8	14.293
3	22 29 55.29	2.2281	4 40 39.7	15.204	3	0 14 33.24	2.1588	7 19 9.9	14.243
4	22 32 8.88	2.2250	4 25 27.0	15.220	4	0 16 42.77	2.1589	7 33 22.9	14.189
5	22 34 22.29	2.2220	4 10 13.3	15.233	5	0 18 52.31	2.1593	7 47 32.6	14.135
6	22 36 35.52	2.2191	3 54 59.0	15.244	6	0 21 1.88	2.1597	8 1 39.1	14.080
7	22 38 48.58	2.2162	3 39 44.0	15.255	7	0 23 11.47	2.1600	8 15 42.2	14.023
8	22 41 1.46	2.2133	3 24 28.4	15.264	8	0 25 21.08	2.1605	8 29 41.8	13.965
9	22 43 14.17	2.2105	3 9 12.3	15.271	9	0 27 30.73	2.1610	8 43 38.0	13.907
10	22 45 26.72	2.2078	2 53 55.9	15.276	10	0 29 40.40	2.1616	8 57 30.6	13.847
11	22 47 39.11	2.2052	2 38 39.2	15.279	11	0 31 50.12	2.1623	9 11 19.6	13.785
12	22 49 51.34	2.2027	2 23 22.4	15.281	12	0 33 59.87	2.1629	9 25 4.9	13.723
13	22 52 3.43	2.2002	2 8 5.5	15.283	13	0 36 9.67	2.1638	9 38 46.4	13.659
14	22 54 15.36	2.1978	1 52 48.5	15.282	14	0 38 19.52	2.1646	9 52 24.0	13.596
15	22 56 27.16	2.1955	1 37 31.7	15.279	15	0 40 29.42	2.1655	10 5 57.8	13.530
16	22 58 38.82	2.1932	1 22 15.0	15.275	16	0 42 39.38	2.1664	10 19 27.6	13.463
17	23 0 50.34	2.1909	1 6 58.7	15.269	17	0 44 49.39	2.1673	10 32 53.3	13.394
18	23 3 1.73	2.1888	0 51 42.7	15.263	18	0 46 59.46	2.1684	10 46 14.9	13.326
19	23 5 13.00	2.1868	0 36 27.2	15.254	19	0 49 9.60	2.1695	10 59 32.4	13.256
20	23 7 24.15	2.1848	0 21 12.2	15.244	20	0 51 19.80	2.1706	11 12 45.6	13.183
21	23 9 35.18	2.1829	-0 5 57.9	15.232	21	0 53 30.07	2.1718	11 25 54.4	13.112
22	23 11 46.10	2.1811	+0 9 15.6	15.219	22	0 55 40.42	2.1731	11 38 59.0	13.039
23	23 13 56.91	2.1793	+0 24 28.4	+15.205	23	0 57 50.84	2.1743	+11 51 59.1	+12.963
JULY 9.					JULY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 16 7.61	2.1776	+0 39 40.2	+15.188	0	1 0 1.33	2.1756	+12 4 54.6	+12.888
1	23 18 18.22	2.1761	0 54 51.0	15.172	1	1 2 11.91	2.1770	12 17 45.6	12.812
2	23 20 28.74	2.1745	1 10 0.8	15.153	2	1 4 22.57	2.1785	12 30 32.0	12.734
3	23 22 39.16	2.1730	1 25 9.3	15.132	3	1 6 33.33	2.1800	12 43 13.7	12.655
4	23 24 49.50	2.1716	1 40 16.6	15.111	4	1 8 44.17	2.1814	12 55 50.6	12.575
5	23 26 59.75	2.1703	1 55 22.6	15.088	5	1 10 55.10	2.1829	13 8 22.7	12.495
6	23 29 9.93	2.1691	2 10 27.1	15.063	6	1 13 6.12	2.1845	13 20 50.0	12.413
7	23 31 20.04	2.1678	2 25 30.2	15.038	7	1 15 17.24	2.1863	13 33 12.2	12.329
8	23 33 30.07	2.1668	2 40 31.6	15.010	8	1 17 28.47	2.1879	13 45 29.5	12.247
9	23 35 40.05	2.1658	2 55 31.4	14.982	9	1 19 39.79	2.1895	13 57 41.8	12.162
10	23 37 49.96	2.1647	3 10 29.4	14.952	10	1 21 51.21	2.1913	14 9 48.9	12.076
11	23 39 59.81	2.1638	3 25 25.6	14.920	11	1 24 2.74	2.1930	14 21 50.9	11.989
12	23 42 9.61	2.1630	3 40 19.8	14.888	12	1 26 14.37	2.1948	14 33 47.6	11.901
13	23 44 19.37	2.1623	3 55 12.1	14.853	13	1 28 26.11	2.1967	14 45 39.0	11.813
14	23 46 29.08	2.1615	4 10 2.2	14.818	14	1 30 37.97	2.1986	14 57 25.1	11.723
15	23 48 38.75	2.1609	4 24 50.2	14.782	15	1 32 49.94	2.2004	15 9 5.7	11.632
16	23 50 48.39	2.1604	4 39 36.0	14.744	16	1 35 2.02	2.2023	15 20 40.9	11.541
17	23 52 58.00	2.1599	4 54 19.5	14.705	17	1 37 14.22	2.2043	15 32 10.6	11.448
18	23 55 7.58	2.1594	5 9 0.6	14.664	18	1 39 26.54	2.2063	15 43 34.7	11.354
19	23 57 17.13	2.1591	5 23 39.2	14.622	19	1 41 38.98	2.2083	15 54 53.1	11.259
20	23 59 26.67	2.1588	5 38 15.2	14.579	20	1 43 51.53	2.2103	16 6 5.8	11.164
21	0 1 36.19	2.1587	5 52 48.7	14.535	21	1 46 4.21	2.2124	16 17 12.8	11.068
22	0 3 45.71	2.1585	6 7 19.4	14.489	22	1 48 17.02	2.2144	16 28 14.0	10.971
23	0 5 55.21	2.1583	6 21 47.4	14.443	23	1 50 29.94	2.2164	16 39 9.3	10.872
24	0 8 4.71	2.1584	+6 36 12.5	+14.394	24	1 52 42.99	2.2186	+16 49 58.6	+10.773

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 12.					JULY 14.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	1 52 42.99	2.2186	+16 49 58.6	+10.773	0	3 41 36.97	2.3113	+23 18 5.7	+5.143
1	1 54 56.17	2.2208	17 0 42.0	10.673	1	3 43 55.68	2.3124	23 23 10.4	5.012
2	1 57 9.48	2.2228	17 11 19.4	10.573	2	3 46 14.46	2.3135	23 28 7.1	4.880
3	1 59 22.91	2.2250	17 21 50.8	10.472	3	3 48 33.30	2.3146	23 32 56.0	4.748
4	2 1 36.48	2.2272	17 32 16.0	10.368	4	3 50 52.21	2.3156	23 37 36.9	4.616
5	2 3 50.17	2.2293	17 42 35.0	10.265	5	3 53 11.17	2.3164	23 42 9.9	4.484
6	2 6 4.00	2.2315	17 52 47.8	10.161	6	3 55 30.18	2.3173	23 46 35.0	4.351
7	2 8 17.95	2.2337	18 2 54.3	10.056	7	3 57 49.24	2.3181	23 50 52.0	4.218
8	2 10 32.04	2.2359	18 12 54.5	9.951	8	4 0 8.35	2.3188	23 55 1.1	4.085
9	2 12 46.26	2.2381	18 22 48.4	9.844	9	4 2 27.50	2.3194	23 59 2.2	3.951
10	2 15 0.61	2.2403	18 32 35.8	9.736	10	4 4 46.68	2.3201	24 2 55.2	3.817
11	2 17 15.09	2.2425	18 42 16.7	9.627	11	4 7 5.91	2.3207	24 6 40.2	3.683
12	2 19 29.71	2.2448	18 51 51.0	9.518	12	4 9 25.16	2.3211	24 10 17.2	3.549
13	2 21 44.46	2.2469	19 1 18.8	9.408	13	4 11 44.44	2.3215	24 13 46.1	3.415
14	2 23 59.34	2.2492	19 10 40.0	9.298	14	4 14 3.74	2.3218	24 17 7.0	3.280
15	2 26 14.36	2.2513	19 19 54.6	9.187	15	4 16 23.05	2.3221	24 20 19.7	3.145
16	2 28 29.50	2.2535	19 29 2.4	9.074	16	4 18 42.39	2.3223	24 23 24.4	3.011
17	2 30 44.78	2.2558	19 38 3.5	8.962	17	4 21 1.73	2.3223	24 26 21.0	2.876
18	2 33 0.19	2.2578	19 46 57.8	8.848	18	4 23 21.07	2.3224	24 29 9.5	2.741
19	2 35 15.72	2.2600	19 55 45.2	8.733	19	4 25 40.42	2.3225	24 31 49.9	2.606
20	2 37 31.39	2.2623	20 4 25.7	8.618	20	4 27 59.77	2.3223	24 34 22.2	2.471
21	2 39 47.19	2.2643	20 12 59.3	8.503	21	4 30 19.10	2.3222	24 36 46.4	2.336
22	2 42 3.11	2.2664	20 21 26.0	8.386	22	4 32 38.43	2.3220	24 39 2.5	2.201
23	2 44 19.16	2.2686	+20 29 45.6	+ 8.268	23	4 34 57.74	2.3217	+24 41 10.5	+2.065
JULY 13.					JULY 15.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	2 46 35.34	2.2707	+20 37 58.1	+ 8.149	0	4 37 17.03	2.3213	+24 43 10.3	+1.929
1	2 48 51.64	2.2728	20 46 3.5	8.031	1	4 39 36.29	2.3208	24 45 2.0	1.794
2	2 51 8.07	2.2748	20 54 1.8	7.913	2	4 41 55.53	2.3203	24 46 45.6	1.660
3	2 53 24.62	2.2768	21 1 53.0	7.793	3	4 44 14.73	2.3197	24 48 21.2	1.525
4	2 55 41.28	2.2788	21 9 36.9	7.671	4	4 46 33.89	2.3190	24 49 48.6	1.390
5	2 57 58.07	2.2808	21 17 13.5	7.549	5	4 48 53.01	2.3182	24 51 7.9	1.254
6	3 0 14.97	2.2827	21 24 42.8	7.428	6	4 51 12.08	2.3174	24 52 19.1	1.119
7	3 2 31.99	2.2847	21 32 4.9	7.306	7	4 53 31.10	2.3166	24 53 22.2	0.984
8	3 4 49.13	2.2865	21 39 19.5	7.183	8	4 55 50.06	2.3155	24 54 17.2	0.850
9	3 7 6.37	2.2883	21 46 26.8	7.059	9	4 58 8.96	2.3144	24 55 4.2	0.716
10	3 9 23.73	2.2902	21 53 26.6	6.934	10	5 0 27.79	2.3133	24 55 43.1	0.582
11	3 11 41.19	2.2919	22 0 18.9	6.810	11	5 2 46.56	2.3121	24 56 14.9	0.447
12	3 13 58.76	2.2938	22 7 3.8	6.685	12	5 5 5.24	2.3108	24 56 36.7	0.313
13	3 16 16.44	2.2954	22 13 41.1	6.559	13	5 7 23.85	2.3095	24 56 51.5	0.179
14	3 18 34.21	2.2971	22 20 10.9	6.433	14	5 9 42.38	2.3081	24 56 58.2	+0.046
15	3 20 52.09	2.2988	22 26 33.0	6.306	15	5 12 0.82	2.3065	24 56 57.0	-0.087
16	3 23 10.06	2.3003	22 32 47.6	6.178	16	5 14 19.16	2.3049	24 56 47.8	0.220
17	3 25 28.12	2.3018	22 38 54.4	6.050	17	5 16 37.41	2.3033	24 56 30.6	0.353
18	3 27 46.28	2.3033	22 44 53.6	5.923	18	5 18 55.56	2.3016	24 56 5.5	0.485
19	3 30 4.52	2.3048	22 50 45.1	5.793	19	5 21 13.60	2.2997	24 55 32.4	0.617
20	3 32 22.86	2.3063	22 56 28.8	5.664	20	5 23 31.52	2.2978	24 54 51.5	0.748
21	3 34 41.27	2.3075	23 2 4.8	5.534	21	5 25 49.34	2.2959	24 54 2.6	0.880
22	3 36 59.76	2.3088	23 7 32.9	5.404	22	5 28 7.03	2.2938	24 53 5.9	1.011
23	3 39 18.33	2.3101	23 12 53.3	5.273	23	5 30 24.60	2.2918	24 52 1.3	1.142
24	3 41 36.97	2.3113	+23 18 5.7	+ 5.143	24	5 32 42.04	2.2896	+24 50 48.9	-1.272

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 16.					JULY 18.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	5 32 42.04	2.2886	+24 50 48.9	-1.272	0	7 18 58.42	2.1212	+21 30 32.0	-6.807
1	5 34 59.35	2.2873	24 49 28.7	1.401	1	7 21 5.56	2.1168	21 23 40.7	6.508
2	5 37 16.52	2.2851	24 48 0.8	1.530	2	7 23 12.44	2.1124	21 16 43.6	6.999
3	5 39 33.56	2.2828	24 46 25.1	1.659	3	7 25 19.05	2.1080	21 9 40.8	7.088
4	5 41 50.45	2.2802	24 44 41.7	1.788	4	7 27 25.40	2.1037	21 2 32.4	7.188
5	5 44 7.18	2.2777	24 42 50.6	1.916	5	7 29 31.49	2.0993	20 55 18.3	7.281
6	5 46 23.77	2.2752	24 40 51.8	2.043	6	7 31 37.32	2.0950	20 47 58.7	7.373
7	5 48 40.20	2.2725	24 38 45.4	2.170	7	7 33 42.89	2.0906	20 40 33.5	7.465
8	5 50 56.47	2.2698	24 36 31.4	2.297	8	7 35 48.19	2.0861	20 33 2.9	7.555
9	5 53 12.57	2.2670	24 34 9.8	2.423	9	7 37 53.22	2.0818	20 25 26.9	7.644
10	5 55 28.51	2.2642	24 31 40.7	2.548	10	7 39 58.00	2.0774	20 17 45.6	7.733
11	5 57 44.27	2.2612	24 29 4.1	2.673	11	7 42 2.51	2.0729	20 9 58.9	7.821
12	5 59 59.85	2.2583	24 26 19.9	2.798	12	7 44 6.75	2.0685	20 2 7.1	7.907
13	6 2 15.28	2.2553	24 23 28.4	2.921	13	7 46 10.73	2.0642	19 54 10.1	7.993
14	6 4 30.48	2.2522	24 20 29.4	3.044	14	7 48 14.45	2.0598	19 46 7.9	8.079
15	6 6 45.52	2.2491	24 17 23.1	3.166	15	7 50 17.90	2.0553	19 38 0.6	8.163
16	6 9 0.37	2.2458	24 14 9.5	3.288	16	7 52 21.09	2.0509	19 29 48.3	8.247
17	6 11 15.02	2.2426	24 10 48.5	3.410	17	7 54 24.01	2.0466	19 21 31.0	8.329
18	6 13 29.48	2.2393	24 7 20.8	3.530	18	7 56 26.68	2.0423	19 13 8.8	8.410
19	6 15 43.73	2.2359	24 3 44.9	3.650	19	7 58 29.08	2.0378	19 4 41.8	8.491
20	6 17 57.79	2.2325	24 0 2.3	3.769	20	8 0 31.22	2.0335	18 56 9.9	8.571
21	6 20 11.63	2.2290	23 56 12.6	3.888	21	8 2 33.10	2.0292	18 47 33.3	8.650
22	6 22 25.27	2.2256	23 52 15.7	4.006	22	8 4 34.72	2.0248	18 38 51.9	8.728
23	6 24 38.70	2.2220	+23 48 11.9	-4.123	23	8 6 36.08	2.0206	+18 30 5.9	-8.804
JULY 17.					JULY 19.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	6 26 51.91	2.2183	+23 44 1.0	-4.240	0	8 8 37.19	2.0163	+18 21 15.4	-8.880
1	6 29 4.90	2.2148	23 39 43.1	4.356	1	8 10 38.04	2.0120	18 12 20.3	8.956
2	6 31 17.68	2.2111	23 35 18.3	4.471	2	8 12 38.63	2.0078	18 3 20.7	9.031
3	6 33 30.23	2.2073	23 30 46.6	4.586	3	8 14 38.97	2.0036	17 54 16.6	9.105
4	6 35 42.55	2.2035	23 26 8.0	4.699	4	8 16 39.06	1.9993	17 45 8.1	9.178
5	6 37 54.65	2.1997	23 21 22.7	4.812	5	8 18 38.89	1.9951	17 35 55.3	9.248
6	6 40 6.51	2.1958	23 16 30.6	4.924	6	8 20 38.47	1.9910	17 26 38.3	9.319
7	6 42 18.14	2.1919	23 11 31.8	5.036	7	8 22 37.81	1.9868	17 17 17.0	9.390
8	6 44 29.54	2.1880	23 6 28.3	5.147	8	8 24 36.89	1.9827	17 7 51.5	9.459
9	6 46 40.70	2.1840	23 1 14.2	5.257	9	8 26 35.73	1.9785	16 58 21.9	9.528
10	6 48 51.62	2.1800	22 55 55.5	5.366	10	8 28 34.32	1.9745	16 48 48.2	9.595
11	6 51 2.30	2.1760	22 50 30.3	5.473	11	8 30 32.87	1.9704	16 39 10.5	9.661
12	6 53 12.74	2.1719	22 44 58.7	5.581	12	8 32 30.77	1.9663	16 29 28.9	9.726
13	6 55 22.93	2.1678	22 39 20.6	5.688	13	8 34 28.63	1.9624	16 19 43.4	9.792
14	6 57 32.87	2.1637	22 33 36.2	5.793	14	8 36 26.26	1.9585	16 9 53.9	9.856
15	6 59 42.57	2.1596	22 27 45.4	5.898	15	8 38 23.65	1.9545	16 0 0.7	9.918
16	7 1 52.02	2.1553	22 21 48.4	6.003	16	8 40 20.80	1.9506	15 50 3.7	9.980
17	7 4 1.21	2.1511	22 15 45.1	6.106	17	8 42 17.72	1.9467	15 40 3.1	10.042
18	7 6 10.15	2.1469	22 9 35.7	6.208	18	8 44 14.40	1.9428	15 29 58.7	10.103
19	7 8 18.84	2.1427	22 3 20.1	6.311	19	8 46 10.86	1.9391	15 19 50.8	10.162
20	7 10 27.27	2.1384	21 56 58.4	6.411	20	8 48 7.09	1.9353	15 9 39.3	10.221
21	7 12 35.45	2.1342	21 50 30.8	6.511	21	8 50 3.09	1.9315	14 59 24.3	10.279
22	7 14 43.37	2.1298	21 43 57.1	6.611	22	8 51 58.87	1.9278	14 49 5.8	10.337
23	7 16 51.02	2.1254	21 37 17.5	6.709	23	8 53 54.43	1.9242	14 38 43.9	10.392
24	7 18 58.42	2.1212	+21 30 32.0	-6.807	24	8 55 49.77	1.9205	+14 28 18.8	-10.447

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 20.					JULY 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 55 49.77	1.9205	+14 28 18.8	-10.447	0	10 24 40.03	1.8003	+5 18 1.6	-12.193
1	8 57 44.89	1.9169	14 17 50.3	10.502	1	10 26 28.01	1.7990	5 5 49.4	12.212
2	8 59 39.80	1.9134	14 7 18.6	10.556	2	10 28 15.91	1.7978	4 53 36.2	12.230
3	9 1 34.50	1.9098	13 56 43.6	10.609	3	10 30 3.75	1.7968	4 41 21.8	12.248
4	9 3 28.98	1.9063	13 46 5.5	10.661	4	10 31 51.53	1.7958	4 29 6.4	12.264
5	9 5 23.26	1.9029	13 35 24.3	10.713	5	10 33 39.24	1.7948	4 16 50.1	12.280
6	9 7 17.33	1.8995	13 24 40.0	10.763	6	10 35 26.90	1.7939	4 4 32.8	12.296
7	9 9 11.20	1.8962	13 13 52.8	10.813	7	10 37 14.51	1.7930	3 52 14.6	12.310
8	9 11 4.87	1.8929	13 3 2.5	10.862	8	10 39 2.06	1.7922	3 39 55.6	12.324
9	9 12 58.35	1.8896	12 52 9.4	10.909	9	10 40 49.57	1.7915	3 27 35.7	12.338
10	9 14 51.62	1.8863	12 41 13.4	10.957	10	10 42 37.04	1.7908	3 15 15.0	12.351
11	9 16 44.71	1.8833	12 30 14.6	11.003	11	10 44 24.47	1.7903	3 2 53.6	12.363
12	9 18 37.61	1.8801	12 19 13.0	11.049	12	10 46 11.87	1.7897	2 50 31.5	12.374
13	9 20 30.32	1.8769	12 8 8.7	11.093	13	10 47 59.23	1.7892	2 38 8.7	12.385
14	9 22 22.84	1.8739	11 57 1.8	11.138	14	10 49 46.57	1.7888	2 25 45.3	12.395
15	9 24 15.19	1.8709	11 45 52.2	11.181	15	10 51 33.88	1.7883	2 13 21.3	12.404
16	9 26 7.35	1.8679	11 34 40.1	11.223	16	10 53 21.17	1.7881	2 0 56.8	12.413
17	9 27 59.34	1.8651	11 23 25.4	11.265	17	10 55 8.45	1.7878	1 48 31.7	12.422
18	9 29 51.16	1.8622	11 12 8.3	11.306	18	10 56 55.71	1.7876	1 36 6.2	12.428
19	9 31 42.80	1.8593	11 0 48.7	11.347	19	10 58 42.96	1.7875	1 23 40.3	12.436
20	9 33 34.28	1.8566	10 49 26.7	11.386	20	11 0 30.21	1.7874	1 11 13.9	12.443
21	9 35 25.59	1.8538	10 38 2.4	11.424	21	11 2 17.45	1.7874	0 58 47.2	12.448
22	9 37 16.74	1.8512	10 26 35.8	11.462	22	11 4 4.70	1.7875	0 46 20.2	12.452
23	9 39 7.73	1.8485	+10 15 7.0	-11.499	23	11 5 51.95	1.7877	+0 33 53.0	-12.456
JULY 21.					JULY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 40 58.56	1.8459	+10 3 35.9	-11.536	0	11 7 39.22	1.7879	+0 21 25.5	-12.460
1	9 42 49.24	1.8434	9 52 2.7	11.572	1	11 9 26.50	1.7881	+0 8 57.8	12.463
2	9 44 39.77	1.8410	9 40 27.3	11.607	2	11 11 13.79	1.7884	-0 3 30.0	12.465
3	9 46 30.16	1.8386	9 28 49.9	11.640	3	11 13 1.11	1.7888	0 15 58.0	12.467
4	9 48 20.40	1.8362	9 17 10.5	11.674	4	11 14 48.44	1.7892	0 28 26.0	12.468
5	9 50 10.50	1.8339	9 5 29.0	11.707	5	11 16 35.81	1.7898	0 40 54.1	12.468
6	9 52 0.47	1.8317	8 53 45.7	11.738	6	11 18 23.21	1.7903	0 53 22.2	12.468
7	9 53 50.30	1.8294	8 42 0.4	11.770	7	11 20 10.65	1.7909	1 5 50.3	12.468
8	9 55 40.00	1.8273	8 30 13.3	11.801	8	11 21 58.12	1.7916	1 18 18.3	12.465
9	9 57 29.57	1.8252	8 18 24.3	11.831	9	11 23 45.64	1.7924	1 30 46.1	12.463
10	9 59 19.02	1.8231	8 6 33.6	11.860	10	11 25 33.21	1.7932	1 43 13.9	12.461
11	10 1 8.34	1.8211	7 54 41.1	11.888	11	11 27 20.82	1.7941	1 55 41.4	12.457
12	10 2 57.55	1.8192	7 42 47.0	11.916	12	11 29 8.50	1.7951	2 8 8.7	12.453
13	10 4 46.64	1.8173	7 30 51.2	11.943	13	11 30 56.23	1.7961	2 20 35.8	12.448
14	10 6 35.62	1.8155	7 18 53.9	11.969	14	11 32 44.03	1.7972	2 33 2.5	12.443
15	10 8 24.50	1.8137	7 6 54.9	11.995	15	11 34 31.69	1.7983	2 45 28.9	12.437
16	10 10 13.26	1.8119	6 54 54.5	12.019	16	11 36 19.83	1.7996	2 57 54.9	12.430
17	10 12 1.93	1.8103	6 42 52.6	12.043	17	11 38 7.84	1.8008	3 10 20.5	12.423
18	10 13 50.50	1.8087	6 30 49.3	12.068	18	11 39 55.92	1.8022	3 22 45.6	12.415
19	10 15 38.97	1.8071	6 18 44.5	12.090	19	11 41 44.10	1.8036	3 35 10.3	12.407
20	10 17 27.35	1.8056	6 6 38.5	12.112	20	11 43 32.35	1.8050	3 47 34.4	12.397
21	10 19 15.64	1.8042	5 54 31.1	12.134	21	11 45 20.70	1.8067	3 59 57.9	12.387
22	10 21 3.85	1.8028	5 42 22.4	12.154	22	11 47 9.15	1.8083	4 12 20.8	12.376
23	10 22 51.98	1.8015	5 30 12.6	12.173	23	11 48 57.69	1.8098	4 24 43.0	12.364
24	10 24 40.03	1.8003	+ 5 18 1.6	-12.193	24	11 50 46.33	1.8116	-4 37 4.5	-12.353

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 24.					JULY 26.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 50 46.38	1.8116	- 4 37 4.5	-12.353	0	13 20 59.95	1.9732	-14 2 25.1	-10.908
1	11 52 35.08	1.8135	4 49 25.3	12.340	1	13 22 58.49	1.9781	14 13 17.8	10.853
2	11 54 23.95	1.8153	5 1 45.3	12.326	2	13 24 57.32	1.9831	14 24 7.4	10.802
3	11 56 12.92	1.8173	5 14 4.4	12.312	3	13 26 56.46	1.9882	14 34 54.0	10.749
4	11 58 2.02	1.8198	5 26 22.7	12.298	4	13 28 55.90	1.9933	14 45 37.3	10.695
5	11 59 51.23	1.8213	5 38 40.1	12.283	5	13 30 55.66	1.9985	14 56 17.4	10.641
6	12 1 40.58	1.8235	5 50 56.6	12.266	6	13 32 55.72	2.0038	15 6 54.2	10.586
7	12 3 30.05	1.8257	6 3 12.0	12.249	7	13 34 56.11	2.0091	15 17 27.7	10.529
8	12 5 19.66	1.8280	6 15 26.5	12.232	8	13 36 56.81	2.0143	15 27 57.7	10.472
9	12 7 9.41	1.8303	6 27 39.8	12.213	9	13 38 57.83	2.0198	15 38 24.3	10.413
10	12 8 59.30	1.8327	6 39 52.1	12.194	10	13 40 59.18	2.0253	15 48 47.3	10.353
11	12 10 49.33	1.8351	6 52 3.1	12.174	11	13 43 0.86	2.0308	15 59 6.7	10.293
12	12 12 39.51	1.8377	7 4 13.0	12.154	12	13 45 2.87	2.0363	16 9 22.5	10.232
13	12 14 29.85	1.8403	7 16 21.6	12.133	13	13 47 5.22	2.0420	16 19 34.5	10.169
14	12 16 20.35	1.8430	7 28 29.0	12.112	14	13 49 7.91	2.0477	16 29 42.8	10.106
15	12 18 11.01	1.8458	7 40 35.0	12.088	15	13 51 10.94	2.0534	16 39 47.2	10.040
16	12 20 1.84	1.8485	7 52 39.6	12.065	16	13 53 14.32	2.0593	16 49 47.6	9.974
17	12 21 52.83	1.8514	8 4 42.8	12.042	17	13 55 18.05	2.0650	16 59 44.1	9.908
18	12 23 44.01	1.8544	8 16 44.6	12.017	18	13 57 22.12	2.0709	17 9 36.6	9.841
19	12 25 35.36	1.8573	8 28 44.8	11.991	19	13 59 26.56	2.0769	17 19 25.0	9.771
20	12 27 26.89	1.8603	8 40 43.5	11.965	20	14 1 31.35	2.0828	17 29 9.1	9.701
21	12 29 18.60	1.8635	8 52 40.6	11.938	21	14 3 36.50	2.0888	17 38 49.1	9.630
22	12 31 10.51	1.8668	9 4 36.1	11.910	22	14 5 42.01	2.0949	17 48 24.7	9.558
23	12 33 2.61	1.8700	- 9 16 29.8	-11.881	23	14 7 47.89	2.1011	-17 57 56.0	-9.485
JULY 25.					JULY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	12 34 54.91	1.8734	- 9 28 21.8	-11.852	0	14 9 54.14	2.1073	-18 7 22.9	-9.410
1	12 36 47.42	1.8768	9 40 12.0	11.823	1	14 12 0.76	2.1134	18 16 45.2	9.334
2	12 38 40.13	1.8803	9 52 0.5	11.792	2	14 14 7.75	2.1197	18 26 3.0	9.257
3	12 40 33.05	1.8838	10 3 47.0	11.760	3	14 16 15.12	2.1259	18 35 16.0	9.178
4	12 42 26.18	1.8874	10 15 31.7	11.728	4	14 18 22.86	2.1322	18 44 24.4	9.100
5	12 44 19.54	1.8911	10 27 14.3	11.694	5	14 20 30.98	2.1386	18 53 28.0	9.019
6	12 46 13.11	1.8948	10 38 55.0	11.661	6	14 22 39.49	2.1450	19 2 26.7	8.938
7	12 48 6.91	1.8987	10 50 33.6	11.625	7	14 24 48.38	2.1514	19 11 20.5	8.855
8	12 50 0.95	1.9025	11 2 10.0	11.590	8	14 26 57.66	2.1579	19 20 9.3	8.771
9	12 51 55.21	1.9064	11 13 44.4	11.554	9	14 29 7.33	2.1643	19 28 53.0	8.686
10	12 53 49.72	1.9104	11 25 16.5	11.516	10	14 31 17.38	2.1708	19 37 31.6	8.600
11	12 55 44.46	1.9145	11 36 46.3	11.478	11	14 33 27.83	2.1774	19 46 5.0	8.513
12	12 57 39.46	1.9187	11 48 13.9	11.440	12	14 35 38.67	2.1840	19 54 33.1	8.423
13	12 59 34.70	1.9228	11 59 39.1	11.399	13	14 37 49.91	2.1906	20 2 55.8	8.333
14	13 1 30.20	1.9271	12 11 1.8	11.358	14	14 40 1.54	2.1973	20 11 13.1	8.242
15	13 3 25.95	1.9314	12 22 22.1	11.318	15	14 42 13.58	2.2039	20 19 24.8	8.148
16	13 5 21.97	1.9358	12 33 39.9	11.275	16	14 44 26.01	2.2106	20 27 30.9	8.055
17	13 7 18.25	1.9403	12 44 55.1	11.232	17	14 46 38.85	2.2173	20 35 31.4	7.961
18	13 9 14.80	1.9448	12 56 7.7	11.188	18	14 48 52.08	2.2239	20 43 26.2	7.864
19	13 11 11.62	1.9493	13 7 17.6	11.143	19	14 51 5.72	2.2308	20 51 15.1	7.766
20	13 13 8.72	1.9540	13 18 24.8	11.097	20	14 53 19.77	2.2374	20 58 58.1	7.667
21	13 15 6.10	1.9587	13 29 29.2	11.049	21	14 55 34.21	2.2441	21 6 35.1	7.567
22	13 17 3.76	1.9634	13 40 30.7	11.002	22	14 57 49.06	2.2509	21 14 6.1	7.466
23	13 19 1.71	1.9683	13 51 29.4	10.953	23	15 0 4.32	2.2577	21 21 31.0	7.363
24	13 20 59.95	1.9732	-14 2 25.1	-10.903	24	15 2 19.98	2.2644	-21 28 49.7	-7.259

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 28.					JULY 30.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	15 2 19.98	2.2644	-21 28 49.7	-7.259	0	16 58 22.77	2.5568	-24 53 6.6	-0.791
1	15 4 36.05	2.2713	21 36 2.1	7.153	1	17 0 55.91	2.5543	24 53 49.2	0.629
2	15 6 52.53	2.2786	21 43 8.1	7.047	2	17 3 29.29	2.5563	24 54 22.1	0.467
3	15 9 9.41	2.2848	21 50 7.7	6.939	3	17 6 2.91	2.5623	24 54 45.2	0.303
4	15 11 26.70	2.2915	21 57 0.8	6.830	4	17 8 36.76	2.5661	24 54 58.5	-0.140
5	15 13 44.39	2.2983	22 3 47.3	6.719	5	17 11 10.84	2.5696	24 55 2.0	+0.025
6	15 16 2.49	2.3051	22 10 27.1	6.608	6	17 13 45.13	2.5738	24 54 55.5	0.191
7	15 18 21.00	2.3118	22 17 0.2	6.494	7	17 16 19.63	2.5768	24 54 39.1	0.356
8	15 20 39.90	2.3185	22 23 26.4	6.380	8	17 18 54.34	2.5800	24 54 12.8	0.523
9	15 22 59.22	2.3253	22 29 45.8	6.264	9	17 21 29.23	2.5832	24 53 36.4	0.691
10	15 25 18.93	2.3319	22 35 58.1	6.147	10	17 24 4.32	2.5863	24 52 49.9	0.858
11	15 27 39.05	2.3386	22 42 3.4	6.029	11	17 26 39.59	2.5893	24 51 53.4	1.027
12	15 29 59.56	2.3453	22 48 1.6	5.910	12	17 29 15.03	2.5920	24 50 46.7	1.196
13	15 32 20.48	2.3519	22 53 52.6	5.788	13	17 31 50.63	2.5947	24 49 29.9	1.365
14	15 34 41.79	2.3585	22 59 36.2	5.666	14	17 34 26.39	2.5973	24 48 2.9	1.535
15	15 37 3.50	2.3652	23 5 12.5	5.543	15	17 37 2.30	2.5997	24 46 25.7	1.705
16	15 39 25.61	2.3718	23 10 41.3	5.417	16	17 39 38.35	2.6019	24 44 38.3	1.876
17	15 41 48.11	2.3783	23 16 2.5	5.291	17	17 42 14.53	2.6041	24 42 40.6	2.047
18	15 44 11.00	2.3847	23 21 16.2	5.164	18	17 44 50.84	2.6062	24 40 32.7	2.218
19	15 46 34.27	2.3912	23 26 22.2	5.035	19	17 47 27.27	2.6080	24 38 14.4	2.390
20	15 48 57.94	2.3976	23 31 20.4	4.905	20	17 50 3.80	2.6098	24 35 45.9	2.561
21	15 51 21.98	2.4039	23 36 10.8	4.774	21	17 52 40.44	2.6113	24 33 7.1	2.733
22	15 53 46.41	2.4103	23 40 53.3	4.642	22	17 55 17.16	2.6128	24 30 17.9	2.906
23	15 56 11.22	2.4166	-23 45 27.8	-4.508	23	17 57 53.98	2.6143	-24 27 18.4	+3.078
JULY 29.					JULY 31.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	15 58 36.40	2.4228	-23 49 54.3	-4.373	0	18 0 30.87	2.6154	-24 24 8.6	+3.250
1	16 1 1.95	2.4290	23 54 12.6	4.237	1	18 3 7.83	2.6165	24 20 48.4	3.423
2	16 3 27.88	2.4351	23 58 22.7	4.099	2	18 5 44.85	2.6174	24 17 17.8	3.596
3	16 5 54.16	2.4411	24 2 24.5	3.960	3	18 8 21.92	2.6182	24 13 36.9	3.768
4	16 8 20.81	2.4472	24 6 17.9	3.820	4	18 10 59.03	2.6188	24 9 45.6	3.941
5	16 10 47.82	2.4531	24 10 2.9	3.679	5	18 13 36.18	2.6194	24 5 44.0	4.113
6	16 13 15.18	2.4589	24 13 39.4	3.538	6	18 16 13.36	2.6198	24 1 32.1	4.285
7	16 15 42.89	2.4647	24 17 7.4	3.394	7	18 18 50.56	2.6201	23 57 9.8	4.458
8	16 18 10.94	2.4704	24 20 26.7	3.248	8	18 21 27.77	2.6203	23 52 37.2	4.629
9	16 20 39.34	2.4761	24 23 37.2	3.103	9	18 24 4.99	2.6203	23 47 54.3	4.801
10	16 23 8.07	2.4816	24 26 39.1	2.957	10	18 26 42.20	2.6201	23 43 1.1	4.973
11	16 25 37.13	2.4871	24 29 32.0	2.808	11	18 29 19.40	2.6198	23 37 57.6	5.143
12	16 28 6.52	2.4925	24 32 16.1	2.660	12	18 31 56.58	2.6194	23 32 44.0	5.313
13	16 30 36.23	2.4979	24 34 51.2	2.509	13	18 34 33.73	2.6189	23 27 20.1	5.484
14	16 33 6.27	2.5032	24 37 17.2	2.358	14	18 37 10.85	2.6183	23 21 45.9	5.655
15	16 35 36.61	2.5083	24 39 34.1	2.205	15	18 39 47.93	2.6175	23 16 1.5	5.823
16	16 38 7.26	2.5133	24 41 41.8	2.053	16	18 42 24.95	2.6166	23 10 7.1	5.992
17	16 40 38.20	2.5183	24 43 40.4	1.898	17	18 45 1.92	2.6157	23 4 2.5	6.161
18	16 43 9.45	2.5232	24 45 29.6	1.743	18	18 47 38.83	2.6145	22 57 47.8	6.329
19	16 45 40.98	2.5279	24 47 9.5	1.586	19	18 50 15.66	2.6132	22 51 23.0	6.496
20	16 48 12.80	2.5326	24 48 39.9	1.428	20	18 52 52.41	2.6118	22 44 48.3	6.663
21	16 50 44.89	2.5372	24 50 0.9	1.271	21	18 55 29.08	2.6104	22 38 3.5	6.828
22	16 53 17.26	2.5416	24 51 12.4	1.112	22	18 58 5.66	2.6088	22 31 8.9	6.993
23	16 55 49.88	2.5459	24 52 14.3	0.952	23	19 0 42.14	2.6070	22 24 4.4	7.158
24	16 58 22.77	2.5503	-24 53 6.6	-0.791	24	19 3 18.50	2.6051	-22 16 50.0	+7.322

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 1.					AUGUST 3.				
0	19 3 18.50	2.6051	-22 16 50.0	+7.322	0	21 4 42.75	2.4343	-13 39 49.0	+13.636
1	19 5 54.75	2.6083	22 9 25.8	7.484	1	21 7 8.67	2.4299	13 26 8.1	13.726
2	19 8 30.89	2.6013	22 1 51.9	7.646	2	21 9 54.34	2.4258	13 12 21.9	13.814
3	19 11 6.90	2.5991	21 54 8.3	7.807	3	21 11 59.76	2.4215	12 58 30.4	13.901
4	19 13 42.78	2.5968	21 46 15.1	7.966	4	21 14 24.92	2.4178	12 44 33.8	13.985
5	19 16 18.52	2.5945	21 38 12.4	8.125	5	21 16 49.83	2.4130	12 30 32.2	14.068
6	19 18 54.12	2.5920	21 30 0.1	8.284	6	21 19 14.48	2.4088	12 16 25.7	14.148
7	19 21 29.56	2.5895	21 21 38.3	8.441	7	21 21 38.89	2.4048	12 2 14.4	14.227
8	19 24 4.86	2.5869	21 13 7.2	8.596	8	21 24 3.06	2.4005	11 47 58.5	14.303
9	19 26 39.99	2.5841	21 4 26.8	8.751	9	21 26 26.95	2.3964	11 33 38.1	14.378
10	19 29 14.95	2.5813	20 55 37.1	8.905	10	21 28 50.62	2.3923	11 19 13.2	14.450
11	19 31 49.75	2.5784	20 46 38.2	9.058	11	21 31 14.03	2.3883	11 4 44.1	14.521
12	19 34 24.36	2.5753	20 37 30.2	9.208	12	21 33 37.21	2.3843	10 50 10.7	14.590
13	19 36 58.79	2.5723	20 28 13.2	9.358	13	21 36 0.14	2.3803	10 35 33.3	14.656
14	19 39 33.04	2.5693	20 18 47.2	9.508	14	21 38 22.84	2.3763	10 20 52.0	14.720
15	19 42 7.10	2.5660	20 9 12.3	9.654	15	21 40 45.29	2.3723	10 6 6.9	14.783
16	19 44 40.96	2.5627	19 59 28.7	9.800	16	21 43 7.52	2.3684	9 51 18.1	14.843
17	19 47 14.62	2.5593	19 49 36.3	9.946	17	21 45 29.50	2.3645	9 36 25.7	14.908
18	19 49 48.08	2.5559	19 39 35.2	10.090	18	21 47 51.26	2.3608	9 21 29.8	14.959
19	19 52 21.33	2.5524	19 29 25.6	10.231	19	21 50 12.79	2.3569	9 6 30.6	15.013
20	19 54 54.37	2.5488	19 19 7.5	10.371	20	21 52 34.09	2.3532	8 51 28.2	15.066
21	19 57 27.19	2.5452	19 8 41.1	10.510	21	21 54 55.17	2.3495	8 36 22.7	15.116
22	19 59 59.79	2.5415	18 58 6.3	10.648	22	21 57 16.03	2.3458	8 21 14.3	15.164
23	20 2 32.17	2.5378	-18 47 23.3	+10.784	23	21 59 36.66	2.3422	- 8 6 3.0	+15.212
AUGUST 2.					AUGUST 4.				
0	20 5 4.33	2.5341	-18 36 32.2	+10.918	0	22 1 57.09	2.3387	- 7 50 48.9	+15.257
1	20 7 36.26	2.5302	18 25 33.1	11.062	1	22 4 17.30	2.3351	7 35 32.2	15.299
2	20 10 7.95	2.5263	18 14 26.0	11.183	2	22 6 37.30	2.3317	7 20 13.0	15.339
3	20 12 39.41	2.5223	18 3 11.1	11.313	3	22 8 57.10	2.3283	7 4 51.5	15.378
4	20 15 10.63	2.5184	17 51 48.5	11.441	4	22 11 16.69	2.3248	6 49 27.6	15.415
5	20 17 41.62	2.5143	17 40 18.2	11.568	5	22 13 36.07	2.3214	6 34 1.7	15.449
6	20 20 12.36	2.5103	17 28 40.3	11.693	6	22 15 55.26	2.3183	6 18 33.7	15.483
7	20 22 42.86	2.5063	17 16 55.1	11.816	7	22 18 14.26	2.3150	6 3 3.7	15.514
8	20 25 13.11	2.5022	17 5 2.4	11.938	8	22 20 33.06	2.3118	5 47 32.0	15.543
9	20 27 43.12	2.4980	16 53 2.6	12.057	9	22 22 51.68	2.3088	5 31 58.6	15.570
10	20 30 12.87	2.4938	16 40 55.6	12.175	10	22 25 10.11	2.3057	5 16 23.6	15.596
11	20 32 42.38	2.4897	16 28 41.6	12.292	11	22 27 28.36	2.3026	5 0 47.1	15.618
12	20 35 11.63	2.4854	16 16 20.6	12.407	12	22 29 46.42	2.2997	4 45 9.4	15.639
13	20 37 40.63	2.4813	16 3 52.8	12.518	13	22 32 4.32	2.2968	4 29 30.4	15.658
14	20 40 9.38	2.4770	15 51 18.4	12.629	14	22 34 22.04	2.2940	4 13 50.4	15.676
15	20 42 37.87	2.4727	15 38 37.3	12.738	15	22 36 39.60	2.2913	3 58 9.3	15.693
16	20 45 6.10	2.4684	15 25 49.8	12.846	16	22 38 56.99	2.2885	3 42 27.3	15.706
17	20 47 34.08	2.4642	15 12 55.8	12.952	17	22 41 14.22	2.2858	3 26 44.6	15.717
18	20 50 1.80	2.4599	14 59 55.6	13.055	18	22 43 31.29	2.2833	3 11 1.3	15.728
19	20 52 29.27	2.4557	14 46 49.2	13.157	19	22 45 48.21	2.2808	2 55 17.3	15.736
20	20 54 56.48	2.4513	14 33 36.8	13.256	20	22 48 4.98	2.2783	2 39 33.0	15.742
21	20 57 23.43	2.4471	14 20 18.5	13.354	21	22 50 21.60	2.2758	2 23 48.3	15.747
22	20 59 50.13	2.4428	14 6 54.3	13.451	22	22 52 38.08	2.2735	2 8 3.4	15.749
23	21 2 16.56	2.4385	13 53 24.4	13.544	23	22 54 54.42	2.2712	1 52 18.4	15.750
24	21 4 42.75	2.4343	-13 39 49.0	+13.636	24	22 57 10.62	2.2689	- 1 36 33.4	+15.748

MOON, 1917.

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 5.					AUGUST 7.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	22 57 10.62	2.2689	- 1 36 33.4	+15.748	0	0 44 42.15	2.2339	+10 26 25.8	+13.790
1	22 59 26.69	2.2668	1 20 48.6	15.746	1	0 46 56.20	2.2346	10 40 11.0	13.714
2	23 1 42.64	2.2648	1 5 3.9	15.742	2	0 49 10.30	2.2353	10 53 51.5	13.637
3	23 3 58.46	2.2627	0 49 19.6	15.734	3	0 51 24.43	2.2359	11 7 27.4	13.559
4	23 6 14.16	2.2607	0 33 35.8	15.727	4	0 53 38.61	2.2367	11 20 58.6	13.480
5	23 8 29.74	2.2588	0 17 52.4	15.717	5	0 55 52.83	2.2374	11 34 25.0	13.400
6	23 10 45.21	2.2569	- 0 2 9.8	15.704	6	0 58 7.10	2.2383	11 47 46.6	13.318
7	23 13 0.57	2.2552	+ 0 13 32.1	15.692	7	1 0 21.42	2.2392	12 1 3.1	13.234
8	23 15 15.83	2.2534	0 29 13.2	15.677	8	1 2 35.80	2.2400	12 14 14.7	13.151
9	23 17 30.98	2.2518	0 44 53.3	15.659	9	1 4 50.22	2.2409	12 27 21.2	13.066
10	23 19 46.04	2.2502	1 0 32.3	15.641	10	1 7 4.71	2.2419	12 40 22.6	12.979
11	23 22 1.00	2.2486	1 16 10.2	15.621	11	1 9 19.25	2.2429	12 53 18.7	12.892
12	23 24 15.87	2.2472	1 31 46.8	15.598	12	1 11 33.86	2.2440	13 6 9.6	12.804
13	23 26 30.66	2.2458	1 47 22.0	15.575	13	1 13 48.53	2.2451	13 18 55.2	12.714
14	23 28 45.36	2.2444	2 2 55.8	15.550	14	1 16 3.27	2.2462	13 31 35.3	12.623
15	23 30 59.99	2.2432	2 18 28.0	15.523	15	1 18 18.07	2.2473	13 44 10.0	12.532
16	23 33 14.54	2.2419	2 33 58.5	15.494	16	1 20 32.95	2.2485	13 56 39.1	12.439
17	23 35 29.02	2.2408	2 49 27.3	15.464	17	1 22 47.89	2.2497	14 9 2.7	12.345
18	23 37 43.43	2.2397	3 4 54.2	15.433	18	1 25 2.91	2.2509	14 21 20.5	12.250
19	23 39 57.78	2.2387	3 20 19.2	15.399	19	1 27 18.00	2.2522	14 33 32.7	12.154
20	23 42 12.07	2.2377	3 35 42.1	15.364	20	1 29 33.17	2.2535	14 45 39.0	12.058
21	23 44 26.30	2.2368	3 51 2.9	15.328	21	1 31 48.42	2.2548	14 57 39.6	11.960
22	23 46 40.48	2.2359	4 6 21.4	15.289	22	1 34 3.74	2.2560	15 9 34.2	11.861
23	23 48 54.61	2.2351	+ 4 21 37.6	+15.250	23	1 36 19.14	2.2574	+15 21 22.9	+11.761
AUGUST 6.					AUGUST 8.				
0	23 51 8.69	2.2343	+ 4 36 51.4	+15.208	0	1 38 34.63	2.2588	+15 33 5.5	+11.660
1	23 53 22.73	2.2338	4 52 2.6	15.166	1	1 40 50.20	2.2602	15 44 42.1	11.558
2	23 55 36.74	2.2332	5 7 11.3	15.122	2	1 43 5.85	2.2615	15 56 12.5	11.456
3	23 57 50.71	2.2326	5 22 17.2	15.076	3	1 45 21.58	2.2630	16 7 36.8	11.353
4	0 0 4.65	2.2322	5 37 20.4	15.028	4	1 47 37.41	2.2644	16 18 54.8	11.248
5	0 2 18.57	2.2318	5 52 20.6	14.979	5	1 49 53.31	2.2658	16 30 6.5	11.143
6	0 4 32.46	2.2313	6 7 17.9	14.930	6	1 52 9.31	2.2673	16 41 11.9	11.037
7	0 6 46.32	2.2310	6 22 12.2	14.878	7	1 54 25.39	2.2688	16 52 10.9	10.929
8	0 9 0.18	2.2306	6 37 3.3	14.825	8	1 56 41.57	2.2703	17 3 3.4	10.821
9	0 11 14.01	2.2305	6 51 51.2	14.770	9	1 58 57.83	2.2718	17 13 49.4	10.712
10	0 13 27.84	2.2304	7 6 35.7	14.714	10	2 1 14.18	2.2733	17 24 28.8	10.603
11	0 15 41.66	2.2303	7 21 16.9	14.658	11	2 3 30.62	2.2748	17 35 1.7	10.492
12	0 17 55.47	2.2303	7 35 54.6	14.598	12	2 5 47.16	2.2763	17 45 27.8	10.380
13	0 20 9.29	2.2303	7 50 28.7	14.538	13	2 8 3.78	2.2778	17 55 47.3	10.268
14	0 22 23.11	2.2303	8 4 59.2	14.477	14	2 10 20.50	2.2793	18 6 0.0	10.155
15	0 24 36.93	2.2305	8 19 25.9	14.414	15	2 12 37.30	2.2808	18 16 5.9	10.042
16	0 26 50.77	2.2308	8 33 48.9	14.350	16	2 14 54.19	2.2823	18 26 5.0	9.928
17	0 29 4.62	2.2309	8 48 7.9	14.284	17	2 17 11.18	2.2838	18 35 57.2	9.813
18	0 31 18.48	2.2312	9 2 23.0	14.218	18	2 19 28.25	2.2853	18 45 42.5	9.696
19	0 33 32.36	2.2315	9 16 34.0	14.149	19	2 21 45.42	2.2869	18 55 20.7	9.579
20	0 35 46.26	2.2319	9 30 40.9	14.081	20	2 24 2.68	2.2883	19 4 52.0	9.462
21	0 38 0.19	2.2323	9 44 43.7	14.010	21	2 26 20.02	2.2898	19 14 16.2	9.343
22	0 40 14.14	2.2328	9 58 42.1	13.938	22	2 28 37.46	2.2914	19 23 33.2	9.225
23	0 42 28.13	2.2334	10 12 36.2	13.864	23	2 30 54.99	2.2928	19 32 43.2	9.106
24	0 44 42.15	2.2339	+10 26 25.8	+13.790	24	2 33 12.60	2.2943	+19 41 45.9	+ 8.985

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.		
AUGUST 9.							AUGUST 11.								
	h	m	s	s	°	'		h	m	s	s	°	'	''	
0	2	33	12.60	2.2943	+19	41 45.9	+8.985	0	4	24	27.59	2.3244	+24	25 16.2	+2.704
1	2	35	30.30	2.2957	19	50 41.4	8.865	1	4	26	47.04	2.3238	24	27 54.4	2.569
2	2	37	48.08	2.2971	19	59 29.7	8.743	2	4	29	6.44	2.3231	24	30 24.5	2.434
3	2	40	5.95	2.2986	20	8 10.6	8.621	3	4	31	25.81	2.3223	24	32 46.5	2.298
4	2	42	23.91	2.3000	20	16 44.2	8.498	4	4	33	45.12	2.3215	24	35 0.3	2.163
5	2	44	41.95	2.3013	20	25 10.4	8.375	5	4	36	4.39	2.3206	24	37 6.0	2.028
6	2	47	0.06	2.3026	20	33 29.2	8.252	6	4	38	23.59	2.3196	24	39 3.6	1.892
7	2	49	18.26	2.3040	20	41 40.6	8.128	7	4	40	42.74	2.3187	24	40 53.0	1.757
8	2	51	36.54	2.3053	20	49 44.5	8.002	8	4	43	1.83	2.3176	24	42 34.4	1.623
9	2	53	54.90	2.3066	20	57 40.8	7.876	9	4	45	20.85	2.3164	24	44 7.7	1.488
10	2	56	13.33	2.3078	21	5 29.6	7.751	10	4	47	39.80	2.3152	24	45 32.9	1.353
11	2	58	31.83	2.3090	21	13 10.9	7.624	11	4	49	58.67	2.3139	24	46 50.0	1.218
12	3	0	50.41	2.3103	21	20 44.5	7.497	12	4	52	17.47	2.3126	24	47 59.0	1.083
13	3	3	9.06	2.3114	21	28 10.5	7.369	13	4	54	36.18	2.3112	24	49 0.0	0.950
14	3	5	27.78	2.3126	21	35 28.8	7.241	14	4	56	54.81	2.3097	24	49 53.0	0.817
15	3	7	46.57	2.3137	21	42 39.4	7.113	15	4	59	13.34	2.3081	24	50 38.0	0.683
16	3	10	5.42	2.3148	21	49 42.3	6.984	16	5	1	31.78	2.3065	24	51 15.0	0.549
17	3	12	24.34	2.3158	21	56 37.5	6.855	17	5	3	50.12	2.3048	24	51 43.9	0.416
18	3	14	43.32	2.3168	22	3 24.9	6.724	18	5	6	8.36	2.3031	24	52 4.9	0.284
19	3	17	2.35	2.3178	22	10 4.4	6.593	19	5	8	26.49	2.3013	24	52 18.0	0.152
20	3	19	21.45	2.3187	22	16 36.1	6.463	20	5	10	44.52	2.2995	24	52 23.1	+0.019
21	3	21	40.59	2.3195	22	23 0.0	6.333	21	5	13	2.43	2.2975	24	52 20.3	-0.113
22	3	23	59.79	2.3204	22	29 16.0	6.201	22	5	15	20.22	2.2955	24	52 9.6	0.243
23	3	26	19.04	2.3212	+22	35 24.1	+6.069	23	5	17	37.89	2.2934	+24	51 51.1	-0.375
AUGUST 10.							AUGUST 12.								
0	3	28	38.33	2.3219	+22	41 24.3	+5.938	0	5	19	55.43	2.2913	+24	51 24.6	-0.576
1	3	30	57.67	2.3227	22	47 16.6	5.805	1	5	22	12.84	2.2892	24	50 50.4	0.636
2	3	33	17.05	2.3233	22	53 0.9	5.672	2	5	24	30.13	2.2869	24	50 8.3	0.767
3	3	35	36.46	2.3239	22	58 37.2	5.538	3	5	26	47.27	2.2846	24	49 18.4	0.896
4	3	37	55.92	2.3245	23	4 5.5	5.406	4	5	29	4.28	2.2823	24	48 20.8	1.024
5	3	40	15.40	2.3250	23	9 25.9	5.273	5	5	31	21.14	2.2798	24	47 15.5	1.153
6	3	42	34.92	2.3255	23	14 38.2	5.138	6	5	33	37.86	2.2773	24	46 2.5	1.282
7	3	44	54.46	2.3259	23	19 42.5	5.004	7	5	35	54.42	2.2748	24	44 41.7	1.409
8	3	47	14.03	2.3263	23	24 38.7	4.869	8	5	38	10.83	2.2723	24	43 13.4	1.536
9	3	49	33.61	2.3266	23	29 26.8	4.735	9	5	40	27.09	2.2696	24	41 37.4	1.663
10	3	51	53.22	2.3269	23	34 6.9	4.601	10	5	42	43.18	2.2668	24	39 53.8	1.790
11	3	54	12.84	2.3271	23	38 38.9	4.466	11	5	44	59.11	2.2641	24	38 2.6	1.915
12	3	56	32.47	2.3273	23	43 2.8	4.331	12	5	47	14.87	2.2613	24	36 4.0	2.040
13	3	58	52.11	2.3273	23	47 18.6	4.196	13	5	49	30.46	2.2584	24	33 57.8	2.166
14	4	1	11.75	2.3273	23	51 26.3	4.061	14	5	51	45.88	2.2554	24	31 44.1	2.290
15	4	3	31.39	2.3273	23	55 25.9	3.926	15	5	54	1.11	2.2524	24	29 23.0	2.413
16	4	5	51.03	2.3273	23	59 17.4	3.791	16	5	56	16.17	2.2495	24	26 54.5	2.536
17	4	8	10.66	2.3271	24	3 0.8	3.655	17	5	58	31.05	2.2463	24	24 18.7	2.658
18	4	10	30.28	2.3269	24	6 36.0	3.518	18	6	0	45.73	2.2432	24	21 35.5	2.782
19	4	12	49.89	2.3267	24	10 3.0	3.383	19	6	3	0.23	2.2401	24	18 44.9	2.903
20	4	15	9.48	2.3263	24	13 22.0	3.248	20	6	5	14.54	2.2368	24	15 47.2	3.023
21	4	17	29.05	2.3259	24	16 32.7	3.112	21	6	7	28.65	2.2335	24	12 42.2	3.143
22	4	19	48.59	2.3255	24	19 35.4	2.977	22	6	9	42.56	2.2302	24	9 30.0	3.263
23	4	22	8.11	2.3250	24	22 29.9	2.840	23	6	11	56.27	2.2268	24	6 10.5	3.382
24	4	24	27.59	2.3244	+24	25 16.2	+2.704	24	6	14	9.78	2.2234	+24	2 41.2	-3.499

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 13.					AUGUST 15.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	6 14 9.78	2.2234	+24 2 44.2	-3.490	0	7 56 24.73	2.0313	+19 12 11.2	-8.306
1	6 16 23.06	2.2200	23 59 10.7	3.618	1	7 58 26.49	2.0273	19 3 50.5	8.386
2	6 18 36.18	2.2166	23 55 30.1	3.735	2	8 0 28.00	2.0232	18 55 24.9	8.465
3	6 20 49.07	2.2130	23 51 42.5	3.851	3	8 2 29.27	2.0191	18 46 54.7	8.543
4	6 23 1.74	2.2093	23 47 48.0	3.967	4	8 4 30.29	2.0150	18 38 19.7	8.622
5	6 25 14.19	2.2058	23 43 46.5	4.082	5	8 6 31.07	2.0110	18 29 40.1	8.698
6	6 27 26.43	2.2022	23 39 38.2	4.196	6	8 8 31.61	2.0069	18 20 56.0	8.773
7	6 29 38.45	2.1985	23 35 23.0	4.310	7	8 10 31.90	2.0028	18 12 7.3	8.849
8	6 31 50.25	2.1948	23 31 1.0	4.423	8	8 12 31.95	1.9988	18 3 14.1	8.924
9	6 34 1.82	2.1910	23 26 32.3	4.535	9	8 14 31.76	1.9948	17 54 16.4	8.998
10	6 36 13.17	2.1872	23 21 56.8	4.647	10	8 16 31.33	1.9909	17 45 14.4	9.070
11	6 38 24.28	2.1833	23 17 14.7	4.757	11	8 18 30.67	1.9870	17 36 8.0	9.142
12	6 40 35.17	2.1796	23 12 26.0	4.867	12	8 20 29.77	1.9830	17 26 57.4	9.213
13	6 42 45.83	2.1757	23 7 30.7	4.977	13	8 22 28.63	1.9791	17 17 42.5	9.283
14	6 44 56.25	2.1718	23 2 28.8	5.085	14	8 24 27.26	1.9753	17 8 23.4	9.353
15	6 47 6.44	2.1679	22 57 20.5	5.193	15	8 26 25.66	1.9714	16 59 0.2	9.421
16	6 49 16.40	2.1639	22 52 5.7	5.300	16	8 28 23.83	1.9675	16 49 32.9	9.489
17	6 51 26.11	2.1599	22 46 44.5	5.406	17	8 30 21.76	1.9637	16 40 1.5	9.556
18	6 53 35.59	2.1560	22 41 17.0	5.512	18	8 32 19.47	1.9600	16 30 26.2	9.622
19	6 55 44.83	2.1519	22 35 43.1	5.617	19	8 34 16.96	1.9563	16 20 46.9	9.688
20	6 57 53.82	2.1478	22 30 3.0	5.721	20	8 36 14.22	1.9525	16 11 3.7	9.753
21	7 0 2.57	2.1438	22 24 16.6	5.824	21	8 38 11.26	1.9488	16 1 16.6	9.816
22	7 2 11.08	2.1398	22 18 24.1	5.926	22	8 40 8.08	1.9452	15 51 25.8	9.878
23	7 4 19.35	2.1357	+22 12 25.5	-6.028	23	8 42 4.68	1.9415	+15 41 31.3	-9.940
AUGUST 14.					AUGUST 16.				
0	7 6 27.36	2.1315	+22 6 20.8	-6.128	0	8 44 1.06	1.9379	+15 31 33.0	-10.002
1	7 8 35.13	2.1274	22 0 10.1	6.228	1	8 45 57.23	1.9343	15 21 31.1	10.062
2	7 10 42.65	2.1233	21 53 53.4	6.328	2	8 47 53.18	1.9308	15 11 25.6	10.121
3	7 12 49.93	2.1192	21 47 30.7	6.427	3	8 49 48.93	1.9273	15 1 16.6	10.180
4	7 14 56.95	2.1150	21 41 2.2	6.524	4	8 51 44.46	1.9238	14 51 4.0	10.238
5	7 17 3.73	2.1108	21 34 27.8	6.621	5	8 53 39.79	1.9204	14 40 48.0	10.295
6	7 19 10.25	2.1067	21 27 47.7	6.717	6	8 55 34.91	1.9170	14 30 28.6	10.351
7	7 21 16.53	2.1025	21 21 1.8	6.813	7	8 57 29.83	1.9137	14 20 5.9	10.406
8	7 23 22.55	2.0983	21 14 10.2	6.907	8	8 59 24.55	1.9103	14 9 39.9	10.461
9	7 25 28.32	2.0941	21 7 13.0	7.000	9	9 1 19.07	1.9070	13 59 10.6	10.515
10	7 27 33.84	2.0899	21 0 10.2	7.093	10	9 3 13.39	1.9038	13 48 38.1	10.568
11	7 29 39.11	2.0858	20 53 1.8	7.186	11	9 5 7.52	1.9005	13 38 2.4	10.621
12	7 31 44.13	2.0816	20 45 47.9	7.277	12	9 7 1.45	1.8973	13 27 23.6	10.672
13	7 33 48.90	2.0773	20 38 28.6	7.367	13	9 8 55.20	1.8943	13 16 41.8	10.723
14	7 35 53.41	2.0731	20 31 3.9	7.457	14	9 10 48.76	1.8911	13 5 56.9	10.773
15	7 37 57.67	2.0689	20 23 33.8	7.545	15	9 12 42.13	1.8880	12 55 9.1	10.821
16	7 40 1.68	2.0648	20 15 58.5	7.633	16	9 14 35.32	1.8850	12 44 18.4	10.869
17	7 42 5.44	2.0606	20 8 17.9	7.720	17	9 16 28.33	1.8820	12 33 24.8	10.918
18	7 44 8.95	2.0563	20 0 32.1	7.806	18	9 18 21.16	1.8791	12 22 28.3	10.964
19	7 46 12.21	2.0522	19 52 41.2	7.891	19	9 20 13.82	1.8763	12 11 29.1	11.009
20	7 48 15.21	2.0480	19 44 45.2	7.976	20	9 22 6.31	1.8734	12 0 27.2	11.055
21	7 50 17.97	2.0438	19 36 44.1	8.059	21	9 23 58.63	1.8705	11 49 22.5	11.100
22	7 52 20.47	2.0397	19 28 38.1	8.142	22	9 25 50.77	1.8678	11 38 15.2	11.143
23	7 54 22.73	2.0355	19 20 27.1	8.224	23	9 27 42.76	1.8650	11 27 5.4	11.186
24	7 56 24.73	2.0313	+19 12 11.2	-8.305	24	9 29 34.57	1.8623	+11 15 52.9	-11.228

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 17.					AUGUST 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 29 34.57	1.8623	+11 15 52.9	-11.228	0	10 56 47.33	1.7912	+1 42 32.4	-12.385
1	9 31 26.23	1.8597	11 4 38.0	11.269	1	10 58 34.79	1.7910	1 30 9.1	12.391
2	9 33 17.73	1.8571	10 53 20.6	11.310	2	11 0 22.25	1.7909	1 17 45.5	12.397
3	9 35 9.08	1.8546	10 42 0.8	11.350	3	11 2 9.70	1.7908	1 5 21.5	12.403
4	9 37 0.28	1.8521	10 30 38.6	11.389	4	11 3 57.14	1.7908	0 52 57.2	12.408
5	9 38 51.33	1.8497	10 19 14.1	11.428	5	11 5 44.59	1.7908	0 40 32.6	12.412
6	9 40 42.24	1.8473	10 7 47.3	11.466	6	11 7 32.04	1.7909	0 28 7.8	12.415
7	9 42 33.00	1.8448	9 56 18.3	11.502	7	11 9 19.50	1.7911	0 15 42.8	12.418
8	9 44 23.62	1.8425	9 44 47.1	11.538	8	11 11 6.97	1.7913	+0 3 17.7	12.419
9	9 46 14.10	1.8403	9 33 13.8	11.573	9	11 12 54.45	1.7915	-0 9 7.5	12.421
10	9 48 4.45	1.8380	9 21 38.4	11.607	10	11 14 41.95	1.7919	0 21 32.8	12.421
11	9 49 54.66	1.8358	9 10 1.0	11.641	11	11 16 29.48	1.7923	0 33 58.0	12.421
12	9 51 44.75	1.8338	8 58 21.5	11.674	12	11 18 17.02	1.7926	0 46 23.3	12.421
13	9 53 34.71	1.8316	8 46 40.1	11.707	13	11 20 4.59	1.7932	0 58 48.5	12.418
14	9 55 24.54	1.8296	8 34 56.7	11.738	14	11 21 52.20	1.7938	1 11 13.5	12.417
15	9 57 14.26	1.8276	8 23 11.5	11.769	15	11 23 39.84	1.7943	1 23 38.5	12.414
16	9 59 3.85	1.8257	8 11 24.4	11.799	16	11 25 27.52	1.7949	1 36 3.2	12.410
17	10 0 53.34	1.8238	7 59 35.6	11.828	17	11 27 15.23	1.7957	1 48 27.7	12.406
18	10 2 42.71	1.8219	7 47 45.0	11.857	18	11 29 3.00	1.7965	2 0 51.9	12.400
19	10 4 31.97	1.8202	7 35 52.8	11.884	19	11 30 50.81	1.7973	2 13 15.7	12.395
20	10 6 21.13	1.8185	7 23 58.9	11.912	20	11 32 38.68	1.7983	2 25 39.3	12.389
21	10 8 10.19	1.8168	7 12 3.4	11.938	21	11 34 26.60	1.7992	2 38 2.4	12.381
22	10 9 59.14	1.8151	7 0 6.3	11.964	22	11 36 14.58	1.8002	2 50 25.0	12.373
23	10 11 48.00	1.8136	+ 6 48 7.7	-11.989	23	11 38 2.62	1.8013	-3 2 47.2	-12.366
AUGUST 18.					AUGUST 20.				
0	10 13 36.77	1.8121	+ 6 36 7.6	-12.013	0	11 39 50.73	1.8024	-3 15 8.9	-12.357
1	10 15 25.45	1.8105	6 24 6.1	12.037	1	11 41 38.91	1.8035	3 27 30.0	12.347
2	10 17 14.03	1.8091	6 12 3.2	12.060	2	11 43 27.15	1.8048	3 39 50.5	12.336
3	10 19 2.54	1.8078	5 59 58.9	12.082	3	11 45 15.48	1.8061	3 52 10.3	12.325
4	10 20 50.96	1.8064	5 47 53.4	12.103	4	11 47 3.88	1.8074	4 4 29.5	12.313
5	10 22 39.31	1.8052	5 35 46.5	12.124	5	11 48 52.37	1.8089	4 16 47.9	12.300
6	10 24 27.58	1.8038	5 23 38.5	12.144	6	11 50 40.95	1.8103	4 29 5.5	12.287
7	10 26 15.77	1.8027	5 11 29.2	12.163	7	11 52 29.61	1.8119	4 41 22.3	12.273
8	10 28 3.90	1.8017	4 59 18.9	12.182	8	11 54 18.38	1.8135	4 53 38.2	12.258
9	10 29 51.97	1.8007	4 47 7.4	12.200	9	11 56 7.23	1.8151	5 5 53.2	12.243
10	10 31 39.98	1.7996	4 34 54.9	12.218	10	11 57 56.19	1.8169	5 18 7.3	12.227
11	10 33 27.92	1.7986	4 22 41.3	12.234	11	11 59 45.26	1.8187	5 30 20.4	12.209
12	10 35 15.81	1.7978	4 10 26.8	12.249	12	12 1 34.43	1.8204	5 42 32.4	12.192
13	10 37 3.65	1.7968	3 58 11.4	12.264	13	12 3 23.71	1.8223	5 54 43.4	12.173
14	10 38 51.43	1.7960	3 45 55.1	12.279	14	12 5 13.11	1.8243	6 6 53.2	12.154
15	10 40 39.17	1.7953	3 33 37.9	12.293	15	12 7 2.62	1.8263	6 19 1.9	12.134
16	10 42 26.87	1.7947	3 21 19.9	12.306	16	12 8 52.26	1.8283	6 31 9.3	12.113
17	10 44 14.53	1.7940	3 9 1.2	12.318	17	12 10 42.02	1.8305	6 43 15.5	12.093
18	10 46 2.15	1.7935	2 56 41.8	12.329	18	12 12 31.92	1.8327	6 55 20.4	12.071
19	10 47 49.75	1.7930	2 44 21.7	12.341	19	12 14 21.94	1.8348	7 7 24.0	12.048
20	10 49 37.31	1.7924	2 32 0.9	12.351	20	12 16 12.10	1.8372	7 19 26.2	12.024
21	10 51 24.84	1.7921	2 19 39.6	12.360	21	12 18 2.40	1.8395	7 31 26.9	12.000
22	10 53 12.36	1.7918	2 7 17.7	12.369	22	12 19 52.84	1.8419	7 43 26.2	11.975
23	10 54 59.85	1.7914	1 54 55.3	12.378	23	12 21 43.43	1.8444	7 55 23.9	11.949
24	10 56 47.33	1.7912	+ 1 42 32.4	-12.385	24	12 23 34.17	1.8469	-8 7 20.1	-11.923

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 21.					AUGUST 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 23 34.17	1.8469	- 8 7 20.1	-11.923	0	13 56 12.55	2.0335	-16 54 4.9	-9.697
1	12 25 25.06	1.8495	8 19 14.7	11.896	1	13 58 14.72	2.0387	17 3 44.7	9.628
2	12 27 16.11	1.8522	8 31 7.6	11.868	2	14 0 17.19	2.0438	17 13 20.3	9.559
3	12 29 7.32	1.8548	8 42 58.8	11.839	3	14 2 19.97	2.0490	17 22 51.8	9.490
4	12 30 58.69	1.8576	8 54 48.3	11.810	4	14 4 23.07	2.0543	17 32 19.0	9.418
5	12 32 50.23	1.8605	9 6 36.0	11.780	5	14 6 26.48	2.0595	17 41 42.0	9.346
6	12 34 41.95	1.8633	9 18 21.9	11.749	6	14 8 30.21	2.0648	17 51 0.5	9.272
7	12 36 33.83	1.8662	9 30 5.9	11.717	7	14 10 34.26	2.0702	18 0 14.6	9.198
8	12 38 25.89	1.8693	9 41 47.9	11.684	8	14 12 38.63	2.0755	18 9 24.3	9.123
9	12 40 18.14	1.8723	9 53 28.0	11.652	9	14 14 43.32	2.0809	18 18 29.3	9.046
10	12 42 10.57	1.8754	10 5 6.1	11.618	10	14 16 48.34	2.0864	18 27 29.8	8.969
11	12 44 3.19	1.8786	10 16 42.1	11.582	11	14 18 53.69	2.0919	18 36 25.6	8.891
12	12 45 56.00	1.8818	10 28 15.9	11.546	12	14 20 59.37	2.0974	18 45 16.7	8.812
13	12 47 49.00	1.8851	10 39 47.6	11.511	13	14 23 5.38	2.1029	18 54 3.0	8.731
14	12 49 42.21	1.8884	10 51 17.2	11.473	14	14 25 11.72	2.1085	19 2 44.4	8.649
15	12 51 35.61	1.8918	11 2 44.4	11.435	15	14 27 18.40	2.1141	19 11 20.9	8.567
16	12 53 29.22	1.8953	11 14 9.4	11.397	16	14 29 25.41	2.1197	19 19 52.4	8.483
17	12 55 23.04	1.8988	11 25 32.0	11.357	17	14 31 32.76	2.1254	19 28 18.8	8.398
18	12 57 17.07	1.9023	11 36 52.2	11.316	18	14 33 40.46	2.1311	19 36 40.2	8.313
19	12 59 11.32	1.9059	11 48 9.9	11.275	19	14 35 48.49	2.1367	19 44 56.4	8.226
20	13 1 5.78	1.9096	11 59 25.2	11.233	20	14 37 56.86	2.1424	19 53 7.3	8.138
21	13 3 0.47	1.9133	12 10 37.9	11.189	21	14 40 5.58	2.1483	20 1 13.0	8.050
22	13 4 55.38	1.9171	12 21 47.9	11.145	22	14 42 14.65	2.1540	20 9 13.3	7.959
23	13 6 50.52	1.9210	-12 32 55.3	-11.101	23	14 44 24.06	2.1597	-20 17 8.1	-7.868
AUGUST 22.					AUGUST 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 8 45.90	1.9249	-12 44 0.0	-11.056	0	14 46 33.81	2.1655	-20 24 57.5	-7.777
1	13 10 41.51	1.9288	12 55 2.0	11.009	1	14 48 43.92	2.1713	20 32 41.3	7.683
2	13 12 37.35	1.9328	13 6 1.1	10.962	2	14 50 54.37	2.1772	20 40 19.5	7.589
3	13 14 33.44	1.9368	13 16 57.4	10.914	3	14 53 5.18	2.1830	20 47 52.0	7.493
4	13 16 29.77	1.9410	13 27 50.8	10.865	4	14 55 16.33	2.1888	20 55 18.7	7.397
5	13 18 26.36	1.9452	13 38 41.2	10.815	5	14 57 27.84	2.1948	21 2 39.6	7.299
6	13 20 23.19	1.9493	13 49 28.6	10.764	6	14 59 39.70	2.2007	21 9 54.6	7.200
7	13 22 20.27	1.9536	14 0 12.9	10.713	7	15 1 51.92	2.2065	21 17 3.6	7.101
8	13 24 17.62	1.9579	14 10 54.1	10.661	8	15 4 4.48	2.2123	21 24 6.7	7.000
9	13 26 15.22	1.9623	14 21 32.2	10.608	9	15 6 17.40	2.2183	21 31 3.6	6.898
10	13 28 13.09	1.9667	14 32 7.0	10.553	10	15 8 30.67	2.2241	21 37 54.4	6.795
11	13 30 11.22	1.9712	14 42 38.6	10.498	11	15 10 44.29	2.2300	21 44 39.0	6.691
12	13 32 9.63	1.9758	14 53 6.7	10.441	12	15 12 58.27	2.2359	21 51 17.3	6.585
13	13 34 8.31	1.9803	15 3 31.5	10.385	13	15 15 12.60	2.2418	21 57 49.2	6.478
14	13 36 7.26	1.9848	15 13 52.9	10.328	14	15 17 27.29	2.2477	22 4 14.7	6.372
15	13 38 6.49	1.9895	15 24 10.8	10.268	15	15 19 42.32	2.2535	22 10 33.8	6.263
16	13 40 6.00	1.9943	15 34 25.1	10.208	16	15 21 57.71	2.2594	22 16 46.2	6.153
17	13 42 5.80	1.9990	15 44 35.8	10.148	17	15 24 13.45	2.2653	22 22 52.1	6.043
18	13 44 5.88	2.0038	15 54 42.9	10.087	18	15 26 29.55	2.2712	22 28 51.3	5.930
19	13 46 6.25	2.0087	16 4 46.2	10.023	19	15 28 45.99	2.2769	22 34 43.7	5.817
20	13 48 6.92	2.0136	16 14 45.7	9.960	20	15 31 2.78	2.2828	22 40 29.3	5.703
21	13 50 7.88	2.0185	16 24 41.4	9.896	21	15 33 19.93	2.2886	22 46 8.0	5.588
22	13 52 9.14	2.0235	16 34 33.2	9.831	22	15 35 37.41	2.2943	22 51 39.8	5.471
23	13 54 10.70	2.0284	16 44 21.1	9.764	23	15 37 55.25	2.3003	22 57 4.5	5.353
24	13 56 12.55	2.0335	-16 54 4.9	-9.697	24	15 40 13.44	2.3060	-23 2 22.2	-5.235

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 25.					AUGUST 27.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	15 40 13.44	2.3080	-23 2 22.2	-5.235	0	17 36 37.36	2.5174	-24 38 0.4	+1.578
1	15 42 31.97	2.3116	23 7 32.7	5.116	1	17 39 8.48	2.5198	24 36 21.0	1.738
2	15 44 50.83	2.3173	23 12 36.1	4.995	2	17 41 39.74	2.5222	24 34 31.9	1.896
3	15 47 10.04	2.3229	23 17 32.1	4.873	3	17 44 11.14	2.5243	24 32 33.3	2.057
4	15 49 29.58	2.3286	23 22 20.8	4.750	4	17 46 42.66	2.5263	24 30 25.1	2.218
5	15 51 49.47	2.3342	23 27 2.1	4.626	5	17 49 14.30	2.5283	24 28 7.2	2.378
6	15 54 9.68	2.3397	23 31 35.9	4.501	6	17 51 46.06	2.5303	24 25 39.7	2.539
7	15 56 30.23	2.3453	23 36 2.2	4.375	7	17 54 17.93	2.5320	24 23 2.5	2.701
8	15 58 51.11	2.3508	23 40 20.9	4.248	8	17 56 49.90	2.5337	24 20 15.6	2.863
9	16 1 12.32	2.3562	23 44 31.9	4.119	9	17 59 21.97	2.5353	24 17 19.0	3.023
10	16 3 33.85	2.3615	23 48 35.2	3.990	10	18 1 54.13	2.5367	24 14 12.8	3.185
11	16 5 55.70	2.3669	23 52 30.7	3.859	11	18 4 26.37	2.5380	24 10 56.8	3.348
12	16 8 17.88	2.3723	23 56 18.3	3.728	12	18 6 58.69	2.5393	24 7 31.0	3.511
13	16 10 40.37	2.3775	23 59 58.1	3.597	13	18 9 31.08	2.5404	24 3 55.5	3.672
14	16 13 3.18	2.3828	24 3 29.9	3.463	14	18 12 3.54	2.5415	24 0 10.4	3.833
15	16 15 26.30	2.3879	24 6 53.6	3.328	15	18 14 36.06	2.5423	23 56 15.5	3.997
16	16 17 49.73	2.3930	24 10 9.2	3.193	16	18 17 8.62	2.5432	23 52 10.8	4.158
17	16 20 13.46	2.3981	24 13 16.7	3.057	17	18 19 41.24	2.5439	23 47 56.5	4.320
18	16 22 37.50	2.4031	24 16 16.0	2.919	18	18 22 13.89	2.5445	23 43 32.4	4.483
19	16 25 1.83	2.4080	24 19 7.0	2.781	19	18 24 46.58	2.5451	23 38 58.5	4.645
20	16 27 26.46	2.4128	24 21 49.7	2.642	20	18 27 19.30	2.5454	23 34 15.0	4.806
21	16 29 51.37	2.4176	24 24 24.0	2.502	21	18 29 52.03	2.5458	23 29 21.8	4.968
22	16 32 16.57	2.4224	24 26 49.9	2.361	22	18 32 24.79	2.5460	23 24 18.9	5.129
23	16 34 42.06	2.4271	-24 29 7.3	-2.218	23	18 34 57.55	2.5460	-23 19 6.3	+5.291
AUGUST 26.					AUGUST 28.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	16 37 7.82	2.4317	-24 31 16.0	-2.074	0	18 37 30.31	2.5460	-23 13 44.0	+5.452
1	16 39 33.86	2.4363	24 33 16.2	1.932	1	18 40 3.07	2.5459	23 8 12.1	5.613
2	16 42 0.17	2.4407	24 35 7.8	1.787	2	18 42 35.82	2.5458	23 2 30.5	5.773
3	16 44 26.74	2.4451	24 36 50.6	1.642	3	18 45 8.56	2.5455	22 56 39.3	5.933
4	16 46 53.58	2.4494	24 38 24.8	1.496	4	18 47 41.28	2.5451	22 50 38.5	6.093
5	16 49 20.67	2.4537	24 39 50.1	1.348	5	18 50 13.97	2.5446	22 44 28.2	6.252
6	16 51 48.02	2.4578	24 41 6.5	1.200	6	18 52 46.63	2.5440	22 38 8.3	6.412
7	16 54 15.61	2.4618	24 42 14.1	1.052	7	18 55 19.25	2.5433	22 31 38.8	6.570
8	16 56 43.44	2.4658	24 43 12.7	0.902	8	18 57 51.83	2.5426	22 24 59.9	6.727
9	16 59 11.51	2.4698	24 44 2.3	0.752	9	19 0 24.36	2.5417	22 18 11.6	6.884
10	17 1 39.81	2.4736	24 44 42.9	0.601	10	19 2 56.83	2.5408	22 11 13.8	7.042
11	17 4 8.34	2.4773	24 45 14.4	0.449	11	19 5 29.25	2.5398	22 4 6.6	7.198
12	17 6 37.09	2.4810	24 45 36.8	0.297	12	19 8 1.60	2.5387	21 56 50.1	7.353
13	17 9 6.06	2.4846	24 45 50.0	-0.144	13	19 10 33.89	2.5375	21 49 24.3	7.508
14	17 11 35.24	2.4880	24 45 54.1	+0.010	14	19 13 6.10	2.5362	21 41 49.1	7.663
15	17 14 4.62	2.4913	24 45 48.8	0.164	15	19 15 38.23	2.5348	21 34 4.8	7.816
16	17 16 34.20	2.4946	24 45 34.4	0.319	16	19 18 10.27	2.5333	21 26 11.2	7.969
17	17 19 3.97	2.4978	24 45 10.5	0.475	17	19 20 42.23	2.5319	21 18 8.5	8.121
18	17 21 33.94	2.5010	24 44 37.4	0.630	18	19 23 14.10	2.5303	21 9 56.7	8.272
19	17 24 4.09	2.5039	24 43 54.9	0.788	19	19 25 45.87	2.5286	21 1 35.9	8.423
20	17 26 34.41	2.5068	24 43 2.9	0.945	20	19 28 17.53	2.5268	20 53 6.0	8.573
21	17 29 4.91	2.5097	24 42 1.5	1.103	21	19 30 49.09	2.5250	20 44 27.2	8.721
22	17 31 35.57	2.5123	24 40 50.6	1.260	22	19 33 20.53	2.5232	20 35 39.5	8.869
23	17 34 6.39	2.5149	24 39 30.3	1.418	23	19 35 51.87	2.5212	20 26 42.9	9.016
24	17 36 37.36	2.5174	-24 38 0.4	+1.578	24	19 38 23.07	2.5191	-20 17 37.6	+9.162

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 29.					AUGUST 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 38 23.07	2.5191	-20 17 37.6	+ 9.162	0	21 36 14.27	2.3856	-10 33 55.2	+14.571
1	19 40 54.16	2.5171	20 8 23.5	9.307	1	21 38 37.32	2.3828	10 19 18.8	14.643
2	19 43 25.12	2.5150	19 59 0.8	9.451	2	21 41 0.21	2.3802	10 4 38.1	14.713
3	19 45 55.96	2.5128	19 49 29.4	9.593	3	21 43 22.94	2.3774	9 49 53.2	14.781
4	19 48 26.66	2.5105	19 39 49.6	9.735	4	21 45 45.50	2.3747	9 35 4.4	14.847
5	19 50 57.22	2.5082	19 30 1.2	9.877	5	21 48 7.90	2.3720	9 20 11.6	14.912
6	19 53 27.64	2.5058	19 20 4.4	10.016	6	21 50 30.14	2.3694	9 5 15.0	14.973
7	19 55 57.92	2.5034	19 9 59.3	10.153	7	21 52 52.23	2.3668	8 50 14.8	15.033
8	19 58 28.05	2.5010	18 59 46.0	10.291	8	21 55 14.16	2.3643	8 35 11.0	15.093
9	20 0 58.04	2.4985	18 49 24.4	10.428	9	21 57 35.94	2.3618	8 20 3.7	15.149
10	20 3 27.87	2.4959	18 38 54.6	10.563	10	21 59 57.58	2.3593	8 4 53.1	15.203
11	20 5 57.55	2.4933	18 28 16.9	10.696	11	22 2 19.06	2.3568	7 49 39.3	15.256
12	20 8 27.07	2.4907	18 17 31.1	10.828	12	22 4 40.40	2.3545	7 34 22.4	15.307
13	20 10 56.43	2.4880	18 6 37.5	10.959	13	22 7 1.60	2.3521	7 19 2.5	15.355
14	20 13 25.63	2.4853	17 55 36.0	11.089	14	22 9 22.65	2.3498	7 3 39.8	15.402
15	20 15 54.67	2.4826	17 44 26.8	11.218	15	22 11 43.57	2.3475	6 48 14.3	15.447
16	20 18 23.54	2.4798	17 33 9.9	11.344	16	22 14 4.35	2.3453	6 32 46.2	15.489
17	20 20 52.24	2.4770	17 21 45.5	11.470	17	22 16 25.00	2.3431	6 17 15.6	15.530
18	20 23 20.78	2.4742	17 10 13.5	11.594	18	22 18 45.52	2.3409	6 1 42.6	15.568
19	20 25 49.14	2.4713	16 58 34.2	11.717	19	22 21 5.91	2.3388	5 46 7.4	15.605
20	20 28 17.33	2.4684	16 46 47.5	11.838	20	22 23 26.18	2.3368	5 30 30.0	15.641
21	20 30 45.35	2.4655	16 34 53.6	11.958	21	22 25 46.32	2.3348	5 14 50.5	15.673
22	20 33 13.19	2.4626	16 22 52.6	12.076	22	22 28 6.35	2.3328	4 59 9.2	15.703
23	20 35 40.86	2.4597	-16 10 44.5	+12.198	23	22 30 26.26	2.3308	- 4 43 26.1	+15.733
AUGUST 30.					SEPTEMBER 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 38 8.35	2.4567	-15 58 29.4	+12.308	0	22 32 46.05	2.3289	- 4 27 41.3	+15.760
1	20 40 35.66	2.4537	15 46 7.5	12.422	1	22 35 5.73	2.3272	4 11 54.9	15.785
2	20 43 2.79	2.4507	15 33 38.8	12.534	2	22 37 25.31	2.3254	3 56 7.1	15.808
3	20 45 29.74	2.4478	15 21 3.4	12.645	3	22 39 44.78	2.3238	3 40 18.0	15.828
4	20 47 56.52	2.4448	15 8 21.4	12.753	4	22 42 4.16	2.3221	3 24 27.7	15.848
5	20 50 23.11	2.4417	14 55 33.0	12.861	5	22 44 23.43	2.3203	3 8 36.3	15.864
6	20 52 49.52	2.4387	14 42 38.1	12.967	6	22 46 42.60	2.3188	2 52 44.0	15.879
7	20 55 15.75	2.4356	14 29 37.0	13.070	7	22 49 1.69	2.3173	2 36 50.8	15.893
8	20 57 41.79	2.4326	14 16 29.7	13.173	8	22 51 20.68	2.3158	2 20 56.8	15.904
9	21 0 7.66	2.4297	14 3 16.2	13.274	9	22 53 39.59	2.3145	2 5 2.3	15.913
10	21 2 33.35	2.4267	13 49 56.8	13.373	10	22 55 58.42	2.3131	1 49 7.3	15.919
11	21 4 58.86	2.4236	13 36 31.5	13.470	11	22 58 17.16	2.3117	1 33 12.0	15.924
12	21 7 24.18	2.4205	13 23 0.4	13.566	12	23 0 35.82	2.3105	1 17 16.4	15.928
13	21 9 49.32	2.4176	13 9 23.6	13.659	13	23 2 54.42	2.3093	1 1 20.6	15.930
14	21 12 14.29	2.4147	12 55 41.3	13.751	14	23 5 12.94	2.3082	0 45 24.8	15.929
15	21 14 39.08	2.4117	12 41 53.5	13.842	15	23 7 31.40	2.3071	0 29 29.1	15.927
16	21 17 3.69	2.4087	12 28 0.3	13.930	16	23 9 49.79	2.3061	- 0 13 33.6	15.922
17	21 19 28.12	2.4057	12 14 1.9	14.016	17	23 12 8.13	2.3051	+ 0 2 21.5	15.916
18	21 21 52.37	2.4028	11 59 58.4	14.101	18	23 14 26.40	2.3042	0 18 16.3	15.908
19	21 24 16.45	2.3999	11 45 49.8	14.185	19	23 16 44.63	2.3033	0 34 10.4	15.897
20	21 26 40.36	2.3970	11 31 36.2	14.266	20	23 19 2.80	2.3024	0 50 3.9	15.885
21	21 29 4.09	2.3941	11 17 17.9	14.344	21	23 21 20.92	2.3017	1 5 56.6	15.871
22	21 31 27.65	2.3913	11 2 54.9	14.422	22	23 23 39.00	2.3010	1 21 48.4	15.855
23	21 33 51.05	2.3885	10 48 27.3	14.498	23	23 25 57.04	2.3003	1 37 39.2	15.837
24	21 36 14.27	2.3856	-10 33 55.2	+14.571	24	23 28 15.03	2.2996	+ 1 53 28.8	+15.817

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 2.					SEPTEMBER 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 28 15.03	2.2996	+ 1 53 28.8	+15.817	0	1 18 50.72	2.3338	+13 36 41.9	+12.867
1	23 30 32.99	2.2992	2 9 17.2	15.796	1	1 21 10.18	2.3251	13 49 31.0	12.769
2	23 32 50.93	2.2987	2 25 4.3	15.773	2	1 23 29.73	2.3264	14 2 14.2	12.669
3	23 35 8.83	2.2982	2 40 49.9	15.747	3	1 25 49.35	2.3277	14 14 51.3	12.569
4	23 37 26.71	2.2978	2 56 33.9	15.719	4	1 28 9.05	2.3290	14 27 22.5	12.468
5	23 39 44.57	2.2974	3 12 16.2	15.691	5	1 30 28.83	2.3303	14 39 47.4	12.364
6	23 42 2.40	2.2971	3 27 56.8	15.660	6	1 32 48.69	2.3318	14 52 6.2	12.261
7	23 44 20.22	2.2969	3 43 35.4	15.627	7	1 35 8.64	2.3331	15 4 18.7	12.156
8	23 46 38.03	2.2968	3 59 12.0	15.593	8	1 37 28.66	2.3344	15 16 24.9	12.049
9	23 48 55.83	2.2966	4 14 46.6	15.558	9	1 39 48.77	2.3359	15 28 24.6	11.942
10	23 51 13.62	2.2964	4 30 18.9	15.518	10	1 42 8.97	2.3373	15 40 17.9	11.833
11	23 53 31.40	2.2963	4 45 48.8	15.478	11	1 44 29.24	2.3386	15 52 4.6	11.724
12	23 55 49.18	2.2964	5 1 16.3	15.438	12	1 46 49.60	2.3400	16 3 44.8	11.614
13	23 58 6.97	2.2965	5 16 41.3	15.394	13	1 49 10.04	2.3414	16 15 18.3	11.502
14	0 0 24.76	2.2966	5 32 3.6	15.349	14	1 51 30.57	2.3428	16 26 45.0	11.388
15	0 2 42.56	2.2968	5 47 23.2	15.303	15	1 53 51.18	2.3442	16 38 4.9	11.274
16	0 5 0.37	2.2969	6 2 39.9	15.253	16	1 56 11.87	2.3455	16 49 17.9	11.159
17	0 7 18.19	2.2972	6 17 53.6	15.203	17	1 58 32.64	2.3469	17 0 24.0	11.044
18	0 9 36.03	2.2975	6 33 4.3	15.152	18	2 0 53.50	2.3483	17 11 23.2	10.927
19	0 11 53.89	2.2978	6 48 11.8	15.098	19	2 3 14.44	2.3497	17 22 15.2	10.808
20	0 14 11.77	2.2982	7 3 16.0	15.043	20	2 5 35.46	2.3510	17 33 0.2	10.691
21	0 16 29.67	2.2987	7 18 16.9	14.986	21	2 7 56.56	2.3523	17 43 38.1	10.571
22	0 18 47.61	2.2992	7 33 14.3	14.928	22	2 10 17.74	2.3537	17 54 8.7	10.450
23	0 21 5.57	2.2996	+ 7 48 8.2	+14.867	23	2 12 39.00	2.3550	+18 4 32.1	+10.329
SEPTEMBER 3.					SEPTEMBER 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 23 23.56	2.3002	+ 8 2 58.3	+14.804	0	2 15 0.34	2.3563	+18 14 48.2	+10.207
1	0 25 41.59	2.3008	8 17 44.7	14.742	1	2 17 21.76	2.3576	18 24 56.9	10.083
2	0 27 59.65	2.3014	8 32 27.3	14.676	2	2 19 43.25	2.3588	18 34 58.2	9.960
3	0 30 17.76	2.3021	8 47 5.8	14.609	3	2 22 4.82	2.3601	18 44 52.1	9.835
4	0 32 35.90	2.3028	9 1 40.4	14.542	4	2 24 26.46	2.3613	18 54 38.4	9.709
5	0 34 54.09	2.3036	9 16 10.8	14.471	5	2 26 48.18	2.3625	19 4 17.2	9.583
6	0 37 12.33	2.3044	9 30 36.9	14.399	6	2 29 9.96	2.3637	19 13 48.4	9.456
7	0 39 30.62	2.3052	9 44 58.7	14.327	7	2 31 31.82	2.3649	19 23 11.9	9.328
8	0 41 48.95	2.3060	9 59 16.1	14.253	8	2 33 53.75	2.3660	19 32 27.7	9.199
9	0 44 7.34	2.3069	10 13 29.0	14.177	9	2 36 15.74	2.3671	19 41 35.8	9.071
10	0 46 25.78	2.3078	10 27 37.3	14.099	10	2 38 37.80	2.3682	19 50 36.2	8.941
11	0 48 44.28	2.3088	10 41 40.9	14.020	11	2 40 59.92	2.3692	19 59 28.7	8.810
12	0 51 2.84	2.3098	10 55 39.7	13.939	12	2 43 22.10	2.3702	20 8 13.4	8.679
13	0 53 21.46	2.3108	11 9 33.6	13.858	13	2 45 44.34	2.3712	20 16 50.2	8.548
14	0 55 40.14	2.3119	11 23 22.6	13.775	14	2 48 6.64	2.3721	20 25 19.1	8.415
15	0 57 58.89	2.3130	11 37 6.6	13.690	15	2 50 28.99	2.3730	20 33 40.0	8.282
16	1 0 17.70	2.3140	11 50 45.4	13.603	16	2 52 51.40	2.3738	20 41 52.9	8.148
17	1 2 36.57	2.3152	12 4 19.0	13.517	17	2 55 13.85	2.3747	20 49 57.7	8.013
18	1 4 55.52	2.3164	12 17 47.4	13.428	18	2 57 36.36	2.3755	20 57 54.5	7.880
19	1 7 14.54	2.3176	12 31 10.4	13.338	19	2 59 58.91	2.3762	21 5 43.3	7.745
20	1 9 33.63	2.3188	12 44 27.9	13.246	20	3 2 21.50	2.3768	21 13 23.9	7.608
21	1 11 52.79	2.3199	12 57 39.9	13.158	21	3 4 44.13	2.3776	21 20 56.3	7.473
22	1 14 12.02	2.3212	13 10 46.3	13.069	22	3 7 6.81	2.3783	21 28 20.6	7.336
23	1 16 31.33	2.3225	13 23 47.0	12.983	23	3 9 29.52	2.3788	21 35 36.6	7.199
24	1 18 50.72	2.3238	+13 36 41.9	+12.867	24	3 11 52.26	2.3793	+21 42 44.5	+7.063

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 6.					SEPTEMBER 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 11 52.26	2.3793	+21 42 44.5	+7.063	0	5 5 34.71	2.3340	+24 40 5.1	+0.344
1	3 14 15.03	2.3798	21 49 44.1	6.924	1	5 7 54.67	2.3314	24 40 21.7	0.209
2	3 16 37.83	2.3802	21 56 35.4	6.786	2	5 10 14.48	2.3289	24 40 30.2	+0.075
3	3 19 0.65	2.3806	22 3 18.4	6.647	3	5 12 34.14	2.3263	24 40 30.7	-0.060
4	3 21 23.50	2.3809	22 9 53.0	6.508	4	5 14 53.63	2.3235	24 40 23.0	0.194
5	3 23 46.36	2.3812	22 16 19.4	6.370	5	5 17 12.96	2.3208	24 40 7.4	0.328
6	3 26 9.24	2.3813	22 22 37.4	6.230	6	5 19 32.12	2.3178	24 39 43.7	0.461
7	3 28 32.12	2.3815	22 28 47.0	6.090	7	5 21 51.10	2.3150	24 39 12.1	0.593
8	3 30 55.02	2.3817	22 34 48.2	5.950	8	5 24 9.92	2.3121	24 38 32.6	0.724
9	3 33 17.92	2.3817	22 40 41.0	5.809	9	5 26 28.55	2.3090	24 37 45.2	0.857
10	3 35 40.82	2.3816	22 46 25.3	5.669	10	5 28 47.00	2.3060	24 36 49.8	0.988
11	3 38 3.71	2.3816	22 52 1.3	5.529	11	5 31 5.27	2.3029	24 35 46.7	1.118
12	3 40 26.61	2.3815	22 57 28.8	5.388	12	5 33 23.35	2.2998	24 34 35.7	1.248
13	3 42 49.49	2.3813	23 2 47.8	5.247	13	5 35 41.24	2.2965	24 33 17.0	1.377
14	3 45 12.36	2.3811	23 7 58.4	5.106	14	5 37 58.93	2.2932	24 31 50.5	1.506
15	3 47 35.22	2.3808	23 13 0.5	4.964	15	5 40 16.42	2.2898	24 30 16.3	1.633
16	3 49 58.05	2.3803	23 17 54.1	4.823	16	5 42 33.71	2.2864	24 28 34.5	1.761
17	3 52 20.86	2.3799	23 22 39.3	4.682	17	5 44 50.79	2.2830	24 26 45.0	1.888
18	3 54 43.64	2.3794	23 27 15.9	4.540	18	5 47 7.67	2.2796	24 24 48.0	2.013
19	3 57 6.39	2.3789	23 31 44.1	4.398	19	5 49 24.34	2.2761	24 22 43.4	2.139
20	3 59 29.11	2.3783	23 36 3.7	4.257	20	5 51 40.80	2.2725	24 20 31.3	2.264
21	4 1 51.78	2.3776	23 40 14.9	4.115	21	5 53 57.04	2.2688	24 18 11.7	2.389
22	4 4 14.42	2.3768	23 44 17.5	3.973	22	5 56 13.06	2.2653	24 15 44.6	2.513
23	4 6 37.00	2.3759	+23 48 11.6	+3.832	23	5 58 28.87	2.2616	+24 13 10.2	-2.635
SEPTEMBER 7.					SEPTEMBER 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 8 59.53	2.3751	+23 51 57.3	+3.691	0	6 0 44.45	2.2578	+24 10 28.4	-2.758
1	4 11 22.01	2.3742	23 55 34.5	3.548	1	6 2 59.81	2.2540	24 7 39.3	2.879
2	4 13 44.43	2.3732	23 59 3.1	3.407	2	6 5 14.93	2.2502	24 4 42.9	3.000
3	4 16 6.79	2.3721	24 2 23.3	3.266	3	6 7 29.83	2.2463	24 1 39.3	3.121
4	4 18 29.08	2.3709	24 5 35.0	3.124	4	6 9 44.49	2.2424	23 58 28.4	3.240
5	4 20 51.30	2.3698	24 8 38.2	2.983	5	6 11 58.92	2.2385	23 55 10.5	3.358
6	4 23 13.45	2.3685	24 11 32.9	2.842	6	6 14 13.11	2.2345	23 51 45.4	3.477
7	4 25 35.52	2.3671	24 14 19.2	2.702	7	6 16 27.06	2.2305	23 48 13.3	3.594
8	4 27 57.50	2.3657	24 16 57.1	2.561	8	6 18 40.77	2.2265	23 44 34.1	3.711
9	4 30 19.40	2.3642	24 19 26.5	2.419	9	6 20 54.24	2.2224	23 40 48.0	3.827
10	4 32 41.20	2.3626	24 21 47.4	2.279	10	6 23 7.46	2.2183	23 36 54.9	3.942
11	4 35 2.91	2.3611	24 24 0.0	2.139	11	6 25 20.44	2.2143	23 32 55.0	4.056
12	4 37 24.53	2.3594	24 26 4.1	1.999	12	6 27 33.17	2.2101	23 28 48.2	4.170
13	4 39 46.04	2.3576	24 27 59.9	1.860	13	6 29 45.65	2.2059	23 24 34.6	4.283
14	4 42 7.44	2.3558	24 29 47.3	1.720	14	6 31 57.88	2.2017	23 20 14.3	4.395
15	4 44 28.73	2.3539	24 31 26.3	1.582	15	6 34 9.85	2.1974	23 15 47.2	4.506
16	4 46 49.91	2.3519	24 32 57.1	1.443	16	6 36 21.57	2.1933	23 11 13.6	4.617
17	4 49 10.96	2.3499	24 34 19.5	1.304	17	6 38 33.04	2.1899	23 6 33.2	4.727
18	4 51 31.90	2.3478	24 35 33.6	1.166	18	6 40 44.24	2.1847	23 1 46.4	4.835
19	4 53 52.70	2.3457	24 36 39.4	1.028	19	6 42 55.20	2.1804	22 56 53.0	4.943
20	4 56 13.38	2.3435	24 37 37.0	0.891	20	6 45 5.89	2.1760	22 51 53.2	5.051
21	4 58 33.92	2.3413	24 38 26.3	0.753	21	6 47 16.32	2.1717	22 46 46.9	5.158
22	5 0 54.33	2.3389	24 39 7.4	0.618	22	6 49 26.49	2.1673	22 41 34.3	5.263
23	5 3 14.59	2.3365	24 39 40.4	0.481	23	6 51 36.40	2.1630	22 36 15.3	5.368
24	5 5 34.71	2.3340	+24 40 5.1	+0.344	24	6 53 46.05	2.1586	+22 30 50.1	-5.472

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 10.					SEPTEMBER 12.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	6 53 46.05	2.1586	+22 30 50.1	-5.472	0	8 32 22.22	1.9553	+16 23 39.6	-9.513
1	6 55 55.43	2.1542	22 25 18.7	5.576	1	8 34 19.43	1.9517	16 14 6.9	9.578
2	6 58 4.55	2.1498	22 19 41.0	5.678	2	8 36 16.42	1.9480	16 4 30.3	9.641
3	7 0 13.41	2.1454	22 13 57.3	5.779	3	8 38 13.19	1.9443	15 54 50.0	9.703
4	7 2 22.00	2.1410	22 8 7.5	5.881	4	8 40 9.74	1.9407	15 45 5.9	9.766
5	7 4 30.33	2.1366	22 2 11.6	5.982	5	8 42 6.07	1.9371	15 35 18.1	9.828
6	7 6 38.39	2.1321	21 56 9.7	6.080	6	8 44 2.19	1.9337	15 25 26.6	9.888
7	7 8 46.18	2.1277	21 50 2.0	6.178	7	8 45 58.11	1.9302	15 15 31.5	9.948
8	7 10 53.71	2.1233	21 43 48.3	6.277	8	8 47 53.81	1.9267	15 5 32.9	10.007
9	7 13 0.97	2.1188	21 37 28.8	6.373	9	8 49 49.31	1.9233	14 55 30.7	10.065
10	7 15 7.97	2.1144	21 31 3.5	6.470	10	8 51 44.61	1.9199	14 45 25.1	10.122
11	7 17 14.70	2.1100	21 24 32.4	6.565	11	8 53 39.70	1.9165	14 35 16.1	10.179
12	7 19 21.17	2.1056	21 17 55.7	6.659	12	8 55 34.59	1.9133	14 25 3.6	10.235
13	7 21 27.37	2.1012	21 11 13.3	6.753	13	8 57 29.29	1.9100	14 14 47.9	10.290
14	7 23 33.31	2.0967	21 4 25.4	6.845	14	8 59 23.79	1.9068	14 4 28.8	10.345
15	7 25 38.97	2.0923	20 57 31.9	6.938	15	9 1 18.10	1.9036	13 54 6.5	10.398
16	7 27 44.38	2.0878	20 50 32.9	7.028	16	9 3 12.22	1.9004	13 43 41.0	10.451
17	7 29 49.51	2.0834	20 43 28.5	7.118	17	9 5 6.15	1.8973	13 33 12.4	10.503
18	7 31 54.39	2.0791	20 36 18.7	7.208	18	9 6 59.90	1.8943	13 22 40.7	10.554
19	7 33 59.00	2.0746	20 29 3.5	7.298	19	9 8 53.47	1.8913	13 12 5.9	10.605
20	7 36 3.34	2.0703	20 21 43.0	7.385	20	9 10 46.86	1.8883	13 1 28.1	10.655
21	7 38 7.43	2.0659	20 14 17.3	7.472	21	9 12 40.07	1.8853	12 50 47.3	10.704
22	7 40 11.25	2.0615	20 6 46.4	7.558	22	9 14 33.10	1.8825	12 40 3.6	10.753
23	7 42 14.81	2.0571	+19 59 10.3	-7.644	23	9 16 25.97	1.8797	+12 29 17.0	-10.800
SEPTEMBER 11.					SEPTEMBER 13.				
0	7 44 18.10	2.0528	+19 51 29.1	-7.728	0	9 18 18.66	1.8768	+12 18 27.6	-10.847
1	7 46 21.14	2.0485	19 43 42.9	7.812	1	9 20 11.19	1.8742	12 7 35.4	10.893
2	7 48 23.92	2.0442	19 35 51.7	7.894	2	9 22 3.56	1.8714	11 56 40.4	10.939
3	7 50 26.44	2.0399	19 27 55.6	7.977	3	9 23 55.76	1.8688	11 45 42.7	10.983
4	7 52 28.71	2.0357	19 19 54.5	8.059	4	9 25 47.81	1.8662	11 34 42.4	11.028
5	7 54 30.72	2.0314	19 11 48.6	8.138	5	9 27 39.70	1.8636	11 23 39.4	11.071
6	7 56 32.48	2.0272	19 3 37.9	8.218	6	9 29 31.44	1.8611	11 12 33.9	11.113
7	7 58 33.98	2.0230	18 55 22.5	8.297	7	9 31 23.03	1.8587	11 1 25.9	11.155
8	8 0 35.24	2.0188	18 47 2.3	8.375	8	9 33 14.48	1.8563	10 50 15.3	11.197
9	8 2 36.24	2.0146	18 38 37.5	8.453	9	9 35 5.78	1.8538	10 39 2.3	11.236
10	8 4 36.99	2.0104	18 30 8.0	8.528	10	9 36 56.93	1.8514	10 27 47.0	11.276
11	8 6 37.49	2.0063	18 21 34.1	8.603	11	9 38 47.95	1.8492	10 16 29.2	11.315
12	8 8 37.75	2.0023	18 12 55.6	8.678	12	9 40 38.83	1.8469	10 5 9.2	11.353
13	8 10 37.76	1.9982	18 4 12.7	8.753	13	9 42 29.58	1.8448	9 53 46.9	11.390
14	8 12 37.53	1.9942	17 55 25.3	8.826	14	9 44 20.20	1.8427	9 42 22.4	11.427
15	8 14 37.06	1.9902	17 46 33.6	8.898	15	9 46 10.70	1.8406	9 30 55.7	11.463
16	8 16 36.35	1.9862	17 37 37.5	8.970	16	9 48 1.07	1.8385	9 19 26.8	11.498
17	8 18 35.40	1.9822	17 28 37.2	9.040	17	9 49 51.32	1.8365	9 7 55.9	11.533
18	8 20 34.21	1.9783	17 19 32.7	9.110	18	9 51 41.45	1.8345	8 56 22.9	11.567
19	8 22 32.79	1.9744	17 10 24.0	9.179	19	9 53 31.46	1.8326	8 44 47.9	11.600
20	8 24 31.14	1.9705	17 1 11.2	9.248	20	9 55 21.36	1.8308	8 33 10.9	11.633
21	8 26 29.25	1.9667	16 51 54.3	9.315	21	9 57 11.16	1.8291	8 21 32.0	11.664
22	8 28 27.14	1.9628	16 42 33.4	9.382	22	9 59 0.85	1.8273	8 9 51.2	11.696
23	8 30 24.79	1.9590	16 33 8.5	9.448	23	10 0 50.43	1.8255	7 58 8.6	11.726
24	8 32 22.22	1.9553	+16 23 39.6	-9.513	24	10 2 39.91	1.8239	+ 7 46 24.1	-11.756

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 14.					SEPTEMBER 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 2 39.91	1.8239	+7 46 24.1	-11.756	0	11 29 18.52	1.8066	- 1 58 39.3	-12.353
1	10 4 29.30	1.8223	7 34 37.9	11.784	1	11 31 6.95	1.8076	2 11 0.3	12.347
2	10 6 18.59	1.8208	7 22 50.0	11.812	2	11 32 55.43	1.8086	2 23 20.9	12.341
3	10 8 7.80	1.8193	7 11 0.5	11.840	3	11 34 43.98	1.8097	2 35 41.2	12.335
4	10 9 56.91	1.8178	6 59 9.2	11.868	4	11 36 32.59	1.8108	2 48 1.1	12.328
5	10 11 45.94	1.8165	6 47 16.4	11.893	5	11 38 21.27	1.8119	3 0 20.5	12.319
6	10 13 34.89	1.8152	6 35 22.1	11.918	6	11 40 10.02	1.8132	3 12 39.4	12.311
7	10 15 23.76	1.8138	6 23 26.3	11.943	7	11 41 58.85	1.8144	3 24 57.8	12.302
8	10 17 12.55	1.8127	6 11 28.9	11.968	8	11 43 47.75	1.8158	3 37 15.6	12.292
9	10 19 1.28	1.8115	5 59 30.2	11.990	9	11 45 36.74	1.8172	3 49 32.8	12.281
10	10 20 49.93	1.8103	5 47 30.1	12.013	10	11 47 25.81	1.8186	4 1 49.3	12.269
11	10 22 38.51	1.8092	5 35 28.6	12.035	11	11 49 14.97	1.8200	4 14 5.1	12.257
12	10 24 27.03	1.8082	5 23 25.9	12.056	12	11 51 4.21	1.8215	4 26 20.1	12.243
13	10 26 15.49	1.8073	5 11 21.9	12.077	13	11 52 53.55	1.8233	4 38 34.3	12.230
14	10 28 3.90	1.8063	4 59 16.7	12.096	14	11 54 43.00	1.8249	4 50 47.7	12.216
15	10 29 52.25	1.8054	4 47 10.4	12.115	15	11 56 32.54	1.8265	5 3 0.2	12.200
16	10 31 40.55	1.8046	4 35 2.9	12.134	16	11 58 22.18	1.8283	5 15 11.7	12.184
17	10 33 28.80	1.8038	4 22 54.3	12.152	17	12 0 11.94	1.8302	5 27 22.3	12.168
18	10 35 17.01	1.8031	4 10 44.7	12.169	18	12 2 1.80	1.8320	5 39 31.8	12.149
19	10 37 5.17	1.8024	3 58 34.0	12.185	19	12 3 51.78	1.8339	5 51 40.2	12.132
20	10 38 53.30	1.8019	3 46 22.5	12.200	20	12 5 41.87	1.8358	6 3 47.6	12.113
21	10 40 41.40	1.8013	3 34 10.0	12.216	21	12 7 32.08	1.8379	6 15 53.7	12.092
22	10 42 29.46	1.8008	3 21 56.6	12.230	22	12 9 22.42	1.8400	6 27 58.6	12.072
23	10 44 17.50	1.8003	+3 9 42.4	-12.243	23	12 11 12.88	1.8421	- 6 40 2.3	-12.050
SEPTEMBER 15.					SEPTEMBER 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 46 5.50	1.7999	+2 57 27.4	-12.256	0	12 13 3.47	1.8443	- 6 52 4.6	-12.028
1	10 47 53.49	1.7996	2 45 11.7	12.268	1	12 14 54.20	1.8466	7 4 5.6	12.005
2	10 49 41.45	1.7993	2 32 55.3	12.279	2	12 16 45.06	1.8488	7 16 5.2	11.981
3	10 51 29.40	1.7991	2 20 38.2	12.291	3	12 18 36.06	1.8512	7 23 3.3	11.956
4	10 53 17.34	1.7989	2 8 20.4	12.301	4	12 20 27.20	1.8535	7 39 59.9	11.931
5	10 55 5.27	1.7988	1 56 2.1	12.309	5	12 22 18.48	1.8560	7 51 55.0	11.905
6	10 56 53.20	1.7988	1 43 43.3	12.318	6	12 24 9.92	1.8585	8 3 48.5	11.878
7	10 58 41.12	1.7988	1 31 24.0	12.326	7	12 26 1.50	1.8610	8 15 40.3	11.850
8	11 0 29.05	1.7988	1 19 4.2	12.333	8	12 27 53.24	1.8637	8 27 30.5	11.822
9	11 2 16.97	1.7988	1 6 44.0	12.340	9	12 29 45.14	1.8663	8 39 18.9	11.792
10	11 4 4.91	1.7990	0 54 23.4	12.346	10	12 31 37.20	1.8689	8 51 5.5	11.761
11	11 5 52.85	1.7992	0 42 2.5	12.350	11	12 33 29.41	1.8717	9 2 50.2	11.730
12	11 7 40.81	1.7994	0 29 41.4	12.354	12	12 35 21.80	1.8746	9 14 33.1	11.699
13	11 9 28.78	1.7998	0 17 20.0	12.358	13	12 37 14.36	1.8774	9 26 14.1	11.667
14	11 11 16.78	1.8002	+0 4 58.4	12.362	14	12 39 7.09	1.8803	9 37 53.1	11.633
15	11 13 4.80	1.8005	-0 7 23.4	12.364	15	12 40 59.99	1.8833	9 49 30.0	11.598
16	11 14 52.84	1.8009	0 19 45.3	12.366	16	12 42 53.08	1.8863	10 1 4.9	11.563
17	11 16 40.91	1.8015	0 32 7.3	12.367	17	12 44 46.34	1.8893	10 12 37.6	11.528
18	11 18 29.02	1.8021	0 44 29.3	12.366	18	12 46 39.79	1.8924	10 24 8.2	11.491
19	11 20 17.16	1.8027	0 56 51.2	12.365	19	12 48 33.43	1.8956	10 35 36.5	11.453
20	11 22 5.34	1.8034	1 9 13.1	12.364	20	12 50 27.26	1.8988	10 47 2.5	11.415
21	11 23 53.57	1.8042	1 21 34.9	12.363	21	12 52 21.29	1.9021	10 58 26.3	11.376
22	11 25 41.84	1.8049	1 33 56.6	12.359	22	12 54 15.51	1.9053	11 9 47.6	11.335
23	11 27 30.16	1.8057	1 46 18.0	12.356	23	12 56 9.92	1.9086	11 21 6.5	11.293
24	11 29 18.52	1.8066	-1 58 39.3	-12.353	24	12 58 4.54	1.9121	-11 32 22.8	-11.252

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 18.					SEPTEMBER 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 58 4.54	1.9121	-11 32 22.8	-11.262	0	14 34 32.85	2.1205	-19 27 11.0	-8.171
1	12 59 59.37	1.9155	11 43 36.7	11.209	1	14 36 40.23	2.1255	19 35 18.6	8.063
2	13 1 54.40	1.9189	11 54 47.9	11.165	2	14 38 47.91	2.1306	19 43 21.0	7.996
3	13 3 49.64	1.9225	12 5 56.5	11.122	3	14 40 55.90	2.1356	19 51 18.0	7.906
4	13 5 45.10	1.9261	12 17 2.5	11.077	4	14 43 4.18	2.1406	19 59 9.6	7.814
5	13 7 40.77	1.9298	12 28 5.7	11.030	5	14 45 12.77	2.1457	20 6 55.7	7.723
6	13 9 36.67	1.9334	12 39 6.1	10.983	6	14 47 21.66	2.1508	20 14 36.3	7.629
7	13 11 32.78	1.9371	12 50 3.6	10.935	7	14 49 30.86	2.1558	20 22 11.2	7.536
8	13 13 29.12	1.9408	13 0 58.3	10.886	8	14 51 40.35	2.1608	20 29 40.6	7.442
9	13 15 25.68	1.9447	13 11 49.9	10.836	9	14 53 50.15	2.1659	20 37 4.2	7.345
10	13 17 22.48	1.9485	13 22 38.6	10.786	10	14 56 0.26	2.1709	20 44 22.0	7.248
11	13 19 19.50	1.9523	13 33 24.2	10.734	11	14 58 10.66	2.1759	20 51 34.0	7.152
12	13 21 16.76	1.9563	13 44 6.7	10.682	12	15 0 21.37	2.1810	20 58 40.2	7.053
13	13 23 14.26	1.9603	13 54 46.0	10.628	13	15 2 32.38	2.1861	21 5 40.4	6.953
14	13 25 11.99	1.9643	14 5 22.1	10.575	14	15 4 43.70	2.1912	21 12 34.6	6.853
15	13 27 9.97	1.9683	14 15 55.0	10.520	15	15 6 55.32	2.1962	21 19 22.7	6.751
16	13 29 8.19	1.9724	14 26 24.5	10.463	16	15 9 7.24	2.2012	21 26 4.7	6.648
17	13 31 6.66	1.9766	14 36 50.6	10.406	17	15 11 19.46	2.2062	21 32 40.5	6.545
18	13 33 5.38	1.9808	14 47 13.2	10.348	18	15 13 31.98	2.2112	21 39 10.1	6.441
19	13 35 4.35	1.9849	14 57 32.4	10.290	19	15 15 44.80	2.2163	21 45 33.4	6.336
20	13 37 3.57	1.9892	15 7 48.0	10.230	20	15 17 57.93	2.2213	21 51 50.3	6.228
21	13 39 3.05	1.9935	15 18 0.0	10.169	21	15 20 11.35	2.2262	21 58 0.8	6.121
22	13 41 2.79	1.9978	15 28 8.3	10.108	22	15 22 25.07	2.2311	22 4 4.8	6.013
23	13 43 2.79	2.0022	-15 38 12.9	-10.045	23	15 24 39.08	2.2361	-22 10 2.3	-5.903
SEPTEMBER 19.					SEPTEMBER 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 45 3.05	2.0066	-15 48 13.7	-9.982	0	15 26 53.40	2.2411	-22 15 53.2	-5.793
1	13 47 3.58	2.0110	15 58 10.7	9.918	1	15 29 8.01	2.2459	22 21 37.5	5.682
2	13 49 4.37	2.0154	16 8 3.8	9.852	2	15 31 22.91	2.2508	22 27 15.0	5.569
3	13 51 5.43	2.0199	16 17 52.9	9.786	3	15 33 38.11	2.2557	22 32 45.8	5.457
4	13 53 6.76	2.0245	16 27 38.1	9.718	4	15 35 53.59	2.2605	22 38 9.8	5.343
5	13 55 8.37	2.0290	16 37 19.1	9.650	5	15 38 9.37	2.2653	22 43 26.9	5.227
6	13 57 10.24	2.0336	16 46 56.1	9.582	6	15 40 25.43	2.2701	22 48 37.0	5.111
7	13 59 12.40	2.0383	16 56 28.9	9.511	7	15 42 41.78	2.2749	22 53 40.2	4.994
8	14 1 14.83	2.0429	17 5 57.4	9.440	8	15 44 58.42	2.2796	22 58 36.3	4.877
9	14 3 17.55	2.0476	17 15 21.7	9.368	9	15 47 15.33	2.2843	23 3 25.4	4.758
10	14 5 20.54	2.0523	17 24 41.6	9.295	10	15 49 32.53	2.2889	23 8 7.3	4.638
11	14 7 23.82	2.0570	17 33 57.1	9.222	11	15 51 50.00	2.2935	23 12 41.9	4.518
12	14 9 27.38	2.0618	17 43 8.2	9.147	12	15 54 7.75	2.2981	23 17 9.4	4.397
13	14 11 31.23	2.0666	17 52 14.7	9.071	13	15 56 25.77	2.3027	23 21 29.5	4.274
14	14 13 35.37	2.0714	18 1 16.7	8.993	14	15 58 44.07	2.3072	23 25 42.3	4.151
15	14 15 39.80	2.0762	18 10 13.9	8.915	15	16 1 2.63	2.3116	23 29 47.6	4.027
16	14 17 44.51	2.0810	18 19 6.5	8.838	16	16 3 21.46	2.3161	23 33 45.5	3.903
17	14 19 49.52	2.0860	18 27 54.4	8.758	17	16 5 40.56	2.3204	23 37 35.9	3.777
18	14 21 54.83	2.0908	18 36 37.4	8.676	18	16 7 59.91	2.3247	23 41 18.7	3.650
19	14 24 0.42	2.0958	18 45 15.5	8.594	19	16 10 19.52	2.3290	23 44 53.9	3.523
20	14 26 6.32	2.1007	18 53 48.7	8.512	20	16 12 39.39	2.3333	23 48 21.4	3.394
21	14 28 12.50	2.1056	19 2 16.9	8.428	21	16 14 59.51	2.3374	23 51 41.2	3.265
22	14 30 18.99	2.1106	19 10 40.1	8.343	22	16 17 19.88	2.3415	23 54 53.2	3.135
23	14 32 25.77	2.1155	19 18 58.1	8.258	23	16 19 40.49	2.3456	23 57 57.4	3.006
24	14 34 32.85	2.1205	-19 27 11.0	-8.171	24	16 22 1.35	2.3497	-24 0 53.8	-2.874

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
SEPTEMBER 22.									SEPTEMBER 24.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	16	22	1.35	2.3497	-24	0	53.8	-2.874	0	18	18	7.19	2.4578	-23	36	12.1	+ 4.050
1	16	24	22.45	2.3536	24	3	42.3	2.742	1	18	20	34.67	2.4581	23	32	4.6	4.199
2	16	26	43.78	2.3574	24	6	22.8	2.608	2	18	23	2.16	2.4582	23	27	48.2	4.348
3	16	29	5.34	2.3613	24	8	55.3	2.475	3	18	25	29.65	2.4583	23	23	22.8	4.498
4	16	31	27.14	2.3651	24	11	19.8	2.341	4	18	27	57.16	2.4584	23	18	48.4	4.648
5	16	33	49.15	2.3688	24	13	36.2	2.205	5	18	30	24.66	2.4583	23	14	5.0	4.797
6	16	36	11.39	2.3725	24	15	44.4	2.069	6	18	32	52.16	2.4583	23	9	12.8	4.945
7	16	38	33.85	2.3761	24	17	44.5	1.933	7	18	35	19.66	2.4581	23	4	11.6	5.094
8	16	40	56.52	2.3796	24	19	36.4	1.797	8	18	37	47.13	2.4578	22	59	1.5	5.243
9	16	43	19.40	2.3831	24	21	20.1	1.658	9	18	40	14.59	2.4575	22	53	42.5	5.391
10	16	45	42.49	2.3865	24	22	55.4	1.519	10	18	42	42.03	2.4571	22	48	14.6	5.538
11	16	48	5.78	2.3898	24	24	22.4	1.381	11	18	45	9.44	2.4566	22	42	37.9	5.686
12	16	50	29.26	2.3930	24	25	41.1	1.242	12	18	47	36.82	2.4560	22	36	52.3	5.833
13	16	52	52.94	2.3963	24	26	51.4	1.101	13	18	50	4.16	2.4554	22	30	57.9	5.979
14	16	55	16.81	2.3993	24	27	53.2	0.960	14	18	52	31.47	2.4548	22	24	54.8	6.125
15	16	57	40.86	2.4023	24	28	46.6	0.819	15	18	54	58.73	2.4540	22	18	42.9	6.272
16	17	0	5.09	2.4053	24	29	31.5	0.677	16	18	57	25.95	2.4532	22	12	22.2	6.418
17	17	2	29.50	2.4083	24	30	7.8	0.533	17	18	59	53.11	2.4523	22	5	52.8	6.563
18	17	4	54.08	2.4111	24	30	35.5	0.391	18	19	2	20.22	2.4513	21	59	14.7	6.707
19	17	7	18.83	2.4138	24	30	54.7	0.248	19	19	4	47.27	2.4503	21	52	28.0	6.851
20	17	9	43.73	2.4164	24	31	5.2	-0.103	20	19	7	14.26	2.4493	21	45	32.6	6.994
21	17	12	8.80	2.4191	24	31	7.1	+0.041	21	19	9	41.18	2.4482	21	38	28.7	7.138
22	17	14	34.02	2.4215	24	31	0.3	0.187	22	19	12	8.04	2.4470	21	31	16.1	7.280
23	17	16	59.38	2.4239	-24	30	44.7	+0.332	23	19	14	34.82	2.4457	-21	23	55.1	+ 7.422
SEPTEMBER 23.									SEPTEMBER 25.								
0	17	19	24.89	2.4263	-24	30	20.5	+0.477	0	19	17	1.52	2.4443	-21	16	25.5	+ 7.563
1	17	21	50.54	2.4286	24	29	47.5	0.823	1	19	19	28.14	2.4430	21	8	47.5	7.703
2	17	24	16.32	2.4308	24	29	5.7	0.770	2	19	21	54.68	2.4417	21	1	1.1	7.843
3	17	26	42.23	2.4328	24	28	15.1	0.917	3	19	24	21.14	2.4403	20	53	6.3	7.983
4	17	29	8.26	2.4348	24	27	15.7	1.064	4	19	26	47.51	2.4387	20	45	3.1	8.122
5	17	31	34.41	2.4368	24	26	7.4	1.212	5	19	29	13.78	2.4371	20	36	51.7	8.259
6	17	34	0.68	2.4387	24	24	50.3	1.359	6	19	31	39.96	2.4356	20	28	32.0	8.397
7	17	36	27.05	2.4404	24	23	24.3	1.508	7	19	34	6.05	2.4339	20	20	4.1	8.533
8	17	38	53.53	2.4422	24	21	49.4	1.657	8	19	36	32.03	2.4322	20	11	28.1	8.668
9	17	41	20.11	2.4438	24	20	5.5	1.805	9	19	38	57.91	2.4305	20	2	43.9	8.804
10	17	43	46.78	2.4453	24	18	12.8	1.953	10	19	41	23.69	2.4288	19	53	51.6	8.938
11	17	46	13.54	2.4467	24	16	11.1	2.103	11	19	43	49.36	2.4269	19	44	51.4	9.071
12	17	48	40.38	2.4480	24	14	0.5	2.252	12	19	46	14.92	2.4251	19	35	43.1	9.203
13	17	51	7.30	2.4493	24	11	40.9	2.402	13	19	48	40.37	2.4232	19	26	27.0	9.335
14	17	53	34.30	2.4505	24	9	12.3	2.551	14	19	51	5.70	2.4213	19	17	2.9	9.466
15	17	56	1.36	2.4516	24	6	34.8	2.701	15	19	53	30.92	2.4194	19	7	31.1	9.595
16	17	58	28.49	2.4526	24	3	48.2	2.851	16	19	55	56.03	2.4174	18	57	51.5	9.723
17	18	0	55.67	2.4535	24	0	52.7	3.001	17	19	58	21.01	2.4154	18	48	4.3	9.851
18	18	3	22.91	2.4544	23	57	48.1	3.151	18	20	0	45.88	2.4134	18	38	9.4	9.978
19	18	5	50.20	2.4552	23	54	34.6	3.300	19	20	3	10.62	2.4113	18	28	6.9	10.105
20	18	8	17.53	2.4558	23	51	12.1	3.450	20	20	5	35.24	2.4093	18	17	56.8	10.230
21	18	10	44.90	2.4564	23	47	40.6	3.600	21	20	7	59.73	2.4072	18	7	39.3	10.353
22	18	13	12.30	2.4570	23	44	0.1	3.750	22	20	10	24.10	2.4052	17	57	14.4	10.476
23	18	15	39.74	2.4574	23	40	10.6	3.900	23	20	12	48.35	2.4030	17	46	42.2	10.598
24	18	18	7.19	2.4578	-23	36	12.1	+4.050	24	20	15	12.46	2.4008	-17	36	2.7	+10.718

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 26.					SEPTEMBER 28.				
	^h ^m ^s		[°] ['] ["]			^h ^m ^s		[°] ['] ["]	
0	20 15 12.46	2.4006	-17 36 2.7	+10.718	0	22 8 2.83	2.3086	-7 6 51.5	+14.940
1	20 17 36.44	2.3987	17 25 16.0	10.838	1	22 10 21.31	2.3074	6 51 53.6	14.990
2	20 20 0.30	2.3966	17 14 22.2	10.967	2	22 12 39.72	2.3063	6 36 52.7	15.038
3	20 22 24.02	2.3943	17 3 21.2	11.074	3	22 14 58.06	2.3052	6 21 49.0	15.085
4	20 24 47.61	2.3922	16 52 13.3	11.189	4	22 17 16.34	2.3042	6 6 42.5	15.130
5	20 27 11.08	2.3899	16 40 58.5	11.304	5	22 19 34.56	2.3031	5 51 33.4	15.173
6	20 29 34.40	2.3877	16 29 36.8	11.418	6	22 21 52.71	2.3021	5 36 21.8	15.213
7	20 31 57.60	2.3856	16 18 8.3	11.531	7	22 24 10.81	2.3013	5 21 7.8	15.253
8	20 34 20.67	2.3833	16 6 33.1	11.643	8	22 26 28.86	2.3004	5 5 51.4	15.291
9	20 36 43.60	2.3811	15 54 51.2	11.753	9	22 28 46.86	2.2996	4 50 32.9	15.327
10	20 39 6.40	2.3789	15 43 2.8	11.862	10	22 31 4.81	2.2988	4 35 12.2	15.362
11	20 41 29.07	2.3768	15 31 7.8	11.969	11	22 33 22.72	2.2982	4 19 49.5	15.393
12	20 43 51.61	2.3745	15 19 6.5	12.075	12	22 35 40.59	2.2975	4 4 25.0	15.423
13	20 46 14.01	2.3723	15 6 58.8	12.181	13	22 37 58.42	2.2968	3 48 58.7	15.453
14	20 48 36.29	2.3702	14 54 44.8	12.286	14	22 40 16.21	2.2963	3 33 30.7	15.479
15	20 50 58.43	2.3679	14 42 24.6	12.388	15	22 42 33.97	2.2958	3 18 1.2	15.504
16	20 53 20.44	2.3658	14 29 58.3	12.488	16	22 44 51.70	2.2953	3 2 30.2	15.528
17	20 55 42.32	2.3636	14 17 26.0	12.588	17	22 47 9.41	2.2949	2 46 57.8	15.549
18	20 58 4.07	2.3614	14 4 47.8	12.686	18	22 49 27.09	2.2946	2 31 24.3	15.568
19	21 0 25.69	2.3593	13 52 3.7	12.783	19	22 51 44.76	2.2943	2 15 49.6	15.587
20	21 2 47.18	2.3572	13 39 13.8	12.879	20	22 54 2.41	2.2940	2 0 13.9	15.603
21	21 5 8.55	2.3551	13 26 18.2	12.973	21	22 56 20.04	2.2938	1 44 37.3	15.617
22	21 7 29.79	2.3530	13 13 17.0	13.067	22	22 58 37.66	2.2937	1 28 59.9	15.629
23	21 9 50.91	2.3508	-13 0 10.2	+13.158	23	23 0 55.28	2.2936	-1 13 21.8	+15.639
SEPTEMBER 27.					SEPTEMBER 29.				
0	21 12 11.89	2.3488	-12 46 58.0	+13.248	0	23 3 12.89	2.2935	-0 57 43.2	+15.648
1	21 14 32.76	2.3468	12 33 40.5	13.336	1	23 5 30.50	2.2936	0 42 4.1	15.654
2	21 16 53.51	2.3448	12 20 17.7	13.423	2	23 7 48.12	2.2937	0 26 24.7	15.659
3	21 19 14.13	2.3428	12 6 49.7	13.509	3	23 10 5.74	2.2938	-0 10 45.0	15.663
4	21 21 34.64	2.3408	11 53 16.6	13.593	4	23 12 23.37	2.2939	+0 4 54.8	15.663
5	21 23 55.03	2.3389	11 39 38.8	13.675	5	23 14 41.01	2.2941	0 20 34.6	15.663
6	21 26 15.31	2.3370	11 25 55.6	13.757	6	23 16 58.66	2.2944	0 36 14.3	15.660
7	21 28 35.47	2.3352	11 12 7.8	13.836	7	23 19 16.34	2.2948	0 51 53.8	15.656
8	21 30 55.53	2.3333	10 58 15.3	13.913	8	23 21 34.03	2.2951	1 7 33.0	15.650
9	21 33 15.47	2.3314	10 44 18.2	13.989	9	23 23 51.75	2.2956	1 23 11.8	15.641
10	21 35 35.30	2.3297	10 30 16.6	14.065	10	23 26 9.50	2.2961	1 38 49.9	15.631
11	21 37 55.03	2.3279	10 16 10.4	14.138	11	23 28 27.28	2.2966	1 54 27.5	15.620
12	21 40 14.65	2.3262	10 2 0.0	14.209	12	23 30 45.09	2.2972	2 10 4.3	15.606
13	21 42 34.17	2.3245	9 47 45.3	14.279	13	23 33 2.94	2.2978	2 25 40.2	15.589
14	21 44 53.59	2.3229	9 33 26.5	14.348	14	23 35 20.83	2.2985	2 41 15.0	15.572
15	21 47 12.92	2.3213	9 19 3.6	14.415	15	23 37 38.76	2.2993	2 56 48.8	15.558
16	21 49 32.14	2.3197	9 4 36.7	14.480	16	23 39 56.74	2.3001	3 12 21.3	15.531
17	21 51 51.28	2.3183	8 50 6.0	14.543	17	23 42 14.77	2.3009	3 27 52.5	15.508
18	21 54 10.33	2.3167	8 35 31.6	14.604	18	23 44 32.85	2.3018	3 43 22.3	15.483
19	21 56 29.28	2.3152	8 20 53.5	14.665	19	23 46 50.98	2.3027	3 58 50.5	15.456
20	21 58 48.15	2.3138	8 6 11.8	14.723	20	23 49 9.17	2.3037	4 14 17.0	15.428
21	22 1 6.94	2.3125	7 51 26.7	14.780	21	23 51 27.42	2.3047	4 29 41.8	15.398
22	22 3 25.65	2.3112	7 36 38.2	14.836	22	23 53 45.73	2.3058	4 45 4.7	15.365
23	22 5 44.28	2.3098	7 21 46.4	14.889	23	23 56 4.11	2.3069	5 0 25.6	15.336
24	22 8 2.83	2.3086	-7 6 51.5	+14.940	24	23 58 22.56	2.3081	+5 15 44.3	+15.3

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 30.					OCTOBER 2.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	23 58 22.56	2.3061	+ 5 15 44.3	+15.293	0	1 51 9.02	2.3983	+16 15 4.3	+11.555
1	0 0 41.08	2.3093	5 31 0.8	15.257	1	1 53 32.98	2.4004	16 26 34.2	11.440
2	0 2 59.68	2.3106	5 46 15.1	15.217	2	1 55 57.07	2.4024	16 37 57.1	11.323
3	0 5 18.35	2.3118	6 1 26.8	15.176	3	1 58 21.27	2.4044	16 49 13.0	11.207
4	0 7 37.10	2.3132	6 16 36.1	15.132	4	2 0 45.60	2.4065	17 0 21.9	11.088
5	0 9 55.93	2.3146	6 31 42.6	15.086	5	2 3 10.05	2.4085	17 11 23.6	10.968
6	0 12 14.85	2.3160	6 46 46.4	15.040	6	2 5 34.62	2.4104	17 22 18.1	10.848
7	0 14 33.85	2.3174	7 1 47.4	14.991	7	2 7 59.30	2.4123	17 33 5.4	10.726
8	0 16 52.94	2.3190	7 16 45.3	14.940	8	2 10 24.10	2.4143	17 43 45.2	10.603
9	0 19 12.13	2.3205	7 31 40.2	14.888	9	2 12 49.02	2.4162	17 54 17.7	10.478
10	0 21 31.40	2.3221	7 46 31.8	14.833	10	2 15 14.04	2.4180	18 4 42.6	10.353
11	0 23 50.78	2.3237	8 1 20.2	14.778	11	2 17 39.18	2.4198	18 15 0.1	10.228
12	0 26 10.24	2.3253	8 16 5.2	14.720	12	2 20 4.42	2.4216	18 25 9.9	10.099
13	0 28 29.81	2.3270	8 30 46.6	14.661	13	2 22 29.77	2.4234	18 35 12.0	9.971
14	0 30 49.48	2.3288	8 45 24.5	14.599	14	2 24 55.23	2.4251	18 45 6.4	9.842
15	0 33 9.26	2.3305	8 59 58.5	14.536	15	2 27 20.78	2.4267	18 54 53.0	9.712
16	0 35 29.14	2.3323	9 14 28.8	14.472	16	2 29 46.43	2.4283	19 4 31.8	9.580
17	0 37 49.13	2.3341	9 28 55.1	14.405	17	2 32 12.18	2.4300	19 14 2.6	9.448
18	0 40 9.23	2.3360	9 43 17.4	14.337	18	2 34 38.03	2.4315	19 23 25.5	9.315
19	0 42 29.45	2.3378	9 57 35.5	14.267	19	2 37 3.96	2.4329	19 32 40.4	9.181
20	0 44 49.77	2.3397	10 11 49.4	14.196	20	2 39 29.98	2.4343	19 41 47.2	9.047
21	0 47 10.21	2.3417	10 25 59.0	14.123	21	2 41 56.08	2.4358	19 50 46.0	8.911
22	0 49 30.77	2.3436	10 40 4.1	14.048	22	2 44 22.27	2.4372	19 59 36.5	8.773
23	0 51 51.44	2.3456	+10 54 4.7	+13.971	23	2 46 48.54	2.4384	+20 8 18.8	+ 8.637
OCTOBER 1.					OCTOBER 3.				
0	0 54 12.24	2.3476	+11 8 0.6	+13.893	0	2 49 14.88	2.4397	+20 16 52.9	+ 8.499
1	0 56 33.15	2.3496	11 21 51.8	13.813	1	2 51 41.30	2.4408	20 25 18.7	8.360
2	0 58 54.19	2.3516	11 35 38.1	13.731	2	2 54 7.78	2.4419	20 33 36.1	8.220
3	1 1 15.34	2.3536	11 49 19.5	13.648	3	2 56 34.33	2.4431	20 41 45.1	8.080
4	1 3 36.62	2.3558	12 2 55.8	13.563	4	2 59 0.95	2.4441	20 49 45.7	7.940
5	1 5 58.03	2.3578	12 16 27.0	13.477	5	3 1 27.62	2.4450	20 57 37.9	7.798
6	1 8 19.56	2.3599	12 29 53.0	13.389	6	3 3 54.35	2.4458	21 5 21.5	7.656
7	1 10 41.22	2.3620	12 43 13.7	13.299	7	3 6 21.12	2.4467	21 12 56.6	7.514
8	1 13 3.00	2.3641	12 56 28.9	13.208	8	3 8 47.95	2.4475	21 20 23.2	7.371
9	1 15 24.91	2.3663	13 9 38.7	13.116	9	3 11 14.82	2.4482	21 27 41.1	7.227
10	1 17 46.95	2.3683	13 22 42.8	13.022	10	3 13 41.73	2.4488	21 34 50.4	7.083
11	1 20 9.11	2.3705	13 35 41.3	12.927	11	3 16 8.67	2.4493	21 41 51.1	6.938
12	1 22 31.41	2.3728	13 48 34.0	12.829	12	3 18 35.64	2.4498	21 48 43.0	6.793
13	1 24 53.84	2.3748	14 1 20.8	12.731	13	3 21 2.64	2.4502	21 55 26.2	6.648
14	1 27 16.39	2.3770	14 14 1.7	12.631	14	3 23 29.66	2.4505	22 2 0.7	6.502
15	1 29 39.08	2.3792	14 26 36.5	12.529	15	3 25 56.70	2.4508	22 8 26.4	6.356
16	1 32 1.89	2.3813	14 39 5.2	12.427	16	3 28 23.76	2.4510	22 14 43.3	6.208
17	1 34 24.83	2.3835	14 51 27.7	12.323	17	3 30 50.82	2.4511	22 20 51.4	6.062
18	1 36 47.91	2.3857	15 3 43.9	12.217	18	3 33 17.89	2.4511	22 26 50.7	5.914
19	1 39 11.11	2.3878	15 15 53.7	12.110	19	3 35 44.95	2.4511	22 32 41.1	5.766
20	1 41 34.44	2.3898	15 27 57.1	12.002	20	3 38 12.02	2.4510	22 38 22.6	5.618
21	1 43 57.89	2.3920	15 39 53.9	11.892	21	3 40 39.07	2.4508	22 43 55.3	5.470
22	1 46 21.48	2.3942	15 51 44.1	11.781	22	3 43 6.11	2.4505	22 49 19.0	5.322
23	1 48 45.19	2.3962	16 3 27.6	11.668	23	3 45 33.13	2.4502	22 54 33.9	5.173
24	1 51 9.02	2.3983	+16 15 4.3	+11.555	24	3 48 0.13	2.4498	+22 59 39.8	+ 5.024

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 4.					OCTOBER 6.				
	<i>h m s</i>		<i>° ' "</i>	<i>"</i>		<i>h m s</i>		<i>° ' "</i>	<i>"</i>
0	3 48 0.13	2.4408	+22 59 39.8	+5.024	0	5 43 31.31	2.3338	+24 12 0.8	-1.863
1	3 50 27.10	2.4492	23 4 36.8	4.876	1	5 45 51.21	2.3297	24 10 5.1	1.994
2	3 52 54.03	2.4486	23 9 24.9	4.727	2	5 48 10.87	2.3255	24 8 1.5	2.125
3	3 55 20.93	2.4479	23 14 4.0	4.578	3	5 50 30.27	2.3212	24 5 50.1	2.253
4	3 57 47.78	2.4472	23 18 34.2	4.428	4	5 52 49.41	2.3169	24 3 31.1	2.382
5	4 0 14.59	2.4463	23 22 55.4	4.279	5	5 55 8.30	2.3126	24 1 4.3	2.509
6	4 2 41.34	2.4453	23 27 7.7	4.131	6	5 57 26.92	2.3081	23 58 30.0	2.636
7	4 5 8.03	2.4443	23 31 11.1	3.982	7	5 59 45.27	2.3037	23 55 48.0	2.763
8	4 7 34.66	2.4433	23 35 5.5	3.833	8	6 2 3.36	2.2993	23 52 58.5	2.887
9	4 10 1.22	2.4421	23 38 51.0	3.683	9	6 4 21.18	2.2948	23 50 1.6	3.011
10	4 12 27.71	2.4408	23 42 27.5	3.534	10	6 6 38.73	2.2902	23 46 57.2	3.135
11	4 14 54.12	2.4394	23 45 55.1	3.386	11	6 8 56.00	2.2855	23 43 45.4	3.258
12	4 17 20.44	2.4380	23 49 13.8	3.237	12	6 11 12.99	2.2808	23 40 26.3	3.379
13	4 19 46.68	2.4365	23 52 23.5	3.088	13	6 13 29.70	2.2762	23 36 59.9	3.500
14	4 22 12.82	2.4348	23 55 24.4	2.940	14	6 15 46.13	2.2715	23 33 26.3	3.619
15	4 24 38.86	2.4332	23 58 16.3	2.792	15	6 18 2.28	2.2668	23 29 45.6	3.738
16	4 27 4.80	2.4313	24 0 59.4	2.644	16	6 20 18.14	2.2620	23 25 57.7	3.858
17	4 29 30.62	2.4295	24 3 33.6	2.496	17	6 22 33.72	2.2572	23 22 2.7	3.975
18	4 31 56.34	2.4277	24 5 58.9	2.348	18	6 24 49.00	2.2523	23 18 0.7	4.092
19	4 34 21.94	2.4256	24 8 15.4	2.202	19	6 27 3.99	2.2474	23 13 51.7	4.207
20	4 36 47.41	2.4234	24 10 23.1	2.054	20	6 29 18.69	2.2426	23 9 35.9	4.322
21	4 39 12.75	2.4213	24 12 21.9	1.906	21	6 31 33.10	2.2377	23 5 13.1	4.436
22	4 41 37.96	2.4190	24 14 12.0	1.762	22	6 33 47.21	2.2328	23 0 43.6	4.548
23	4 44 3.03	2.4167	+24 15 53.3	+1.615	23	6 36 1.03	2.2278	+22 56 7.3	-4.661
OCTOBER 5.					OCTOBER 7.				
	<i>h m s</i>		<i>° ' "</i>	<i>"</i>		<i>h m s</i>		<i>° ' "</i>	<i>"</i>
0	4 46 27.96	2.4143	+24 17 25.8	+1.469	0	6 38 14.55	2.2228	+22 51 24.3	-4.772
1	4 48 52.74	2.4117	24 18 49.6	1.325	1	6 40 27.77	2.2178	22 46 34.7	4.882
2	4 51 17.36	2.4091	24 20 4.8	1.180	2	6 42 40.69	2.2129	22 41 38.5	4.992
3	4 53 41.83	2.4065	24 21 11.2	1.036	3	6 44 53.32	2.2079	22 36 35.7	5.100
4	4 56 6.14	2.4038	24 22 9.1	0.893	4	6 47 5.64	2.2028	22 31 26.5	5.208
5	4 58 30.28	2.4008	24 22 58.3	0.748	5	6 49 17.65	2.1978	22 26 10.8	5.314
6	5 0 54.24	2.3979	24 23 38.9	0.606	6	6 51 29.37	2.1928	22 20 48.8	5.419
7	5 3 18.03	2.3950	24 24 11.0	0.463	7	6 53 40.78	2.1879	22 15 20.5	5.524
8	5 5 41.64	2.3919	24 24 34.5	0.322	8	6 55 51.89	2.1827	22 9 45.9	5.628
9	5 8 5.06	2.3888	24 24 49.6	0.181	9	6 58 2.70	2.1776	22 4 5.1	5.731
10	5 10 28.29	2.3856	24 24 56.2	+0.089	10	7 0 13.20	2.1725	21 58 18.2	5.833
11	5 12 51.33	2.3823	24 24 54.3	-0.101	11	7 2 23.40	2.1674	21 52 25.2	5.934
12	5 15 14.17	2.3790	24 24 44.1	0.240	12	7 4 33.29	2.1623	21 46 26.1	6.034
13	5 17 36.81	2.3756	24 24 25.5	0.378	13	7 6 42.88	2.1573	21 40 21.1	6.133
14	5 19 59.24	2.3720	24 23 58.7	0.517	14	7 8 52.16	2.1522	21 34 10.1	6.233
15	5 22 21.45	2.3685	24 23 23.5	0.655	15	7 11 1.14	2.1471	21 27 53.2	6.329
16	5 24 43.46	2.3649	24 22 40.1	0.792	16	7 13 9.81	2.1421	21 21 30.6	6.425
17	5 27 5.24	2.3613	24 21 48.5	0.928	17	7 15 18.19	2.1370	21 15 2.2	6.522
18	5 29 26.81	2.3575	24 20 48.7	1.064	18	7 17 26.25	2.1319	21 8 28.0	6.617
19	5 31 48.14	2.3537	24 19 40.8	1.199	19	7 19 34.02	2.1269	21 1 48.2	6.710
20	5 34 9.25	2.3499	24 18 24.8	1.334	20	7 21 41.48	2.1219	20 55 2.8	6.803
21	5 36 30.13	2.3459	24 17 0.7	1.468	21	7 23 48.65	2.1169	20 48 11.9	6.894
22	5 38 50.76	2.3419	24 15 28.7	1.600	22	7 25 55.51	2.1118	20 41 15.5	6.986
23	5 41 11.16	2.3379	24 13 48.7	1.733	23	7 28 2.07	2.1068	20 34 13.6	7.076
24	5 43 31.31	2.3338	+24 12 0.8	-1.863	24	7 30 8.33	2.1018	+20 27 6.4	-7.165

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 8.					OCTOBER 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 30 8.33	2.1018	+20 27 6.4	-7.165	0	9 5 48.49	1.8986	+13 16 42.2	-10.455
1	7 32 14.29	2.0969	20 19 53.8	7.253	1	9 7 42.31	1.8954	13 6 13.4	10.504
2	7 34 19.96	2.0920	20 12 36.0	7.341	2	9 9 35.94	1.8923	12 55 41.7	10.553
3	7 36 25.33	2.0870	20 5 12.9	7.428	3	9 11 29.38	1.8891	12 45 7.0	10.602
4	7 38 30.40	2.0822	19 57 44.7	7.513	4	9 13 22.63	1.8860	12 34 29.5	10.648
5	7 40 35.19	2.0773	19 50 11.4	7.598	5	9 15 15.70	1.8831	12 23 49.2	10.695
6	7 42 39.67	2.0723	19 42 33.0	7.683	6	9 17 8.60	1.8802	12 13 6.1	10.741
7	7 44 43.87	2.0676	19 34 49.5	7.765	7	9 19 1.32	1.8773	12 2 20.3	10.786
8	7 46 47.78	2.0627	19 27 1.2	7.847	8	9 20 53.87	1.8744	11 51 31.8	10.831
9	7 48 51.39	2.0578	19 19 7.9	7.928	9	9 22 46.25	1.8716	11 40 40.6	10.874
10	7 50 54.72	2.0532	19 11 9.8	8.008	10	9 24 38.46	1.8688	11 29 46.9	10.918
11	7 52 57.77	2.0484	19 3 6.9	8.088	11	9 26 30.51	1.8662	11 18 50.5	10.960
12	7 55 0.53	2.0437	18 54 59.2	8.167	12	9 28 22.40	1.8635	11 7 51.7	11.001
13	7 57 3.01	2.0390	18 46 46.9	8.245	13	9 30 14.13	1.8609	10 56 50.4	11.042
14	7 59 5.21	2.0343	18 38 29.8	8.323	14	9 32 5.71	1.8584	10 45 46.7	11.082
15	8 1 7.13	2.0297	18 30 8.2	8.398	15	9 33 57.14	1.8560	10 34 40.6	11.122
16	8 3 8.77	2.0250	18 21 42.1	8.473	16	9 35 48.43	1.8536	10 23 32.1	11.161
17	8 5 10.13	2.0205	18 13 11.5	8.548	17	9 37 39.57	1.8512	10 12 21.3	11.198
18	8 7 11.23	2.0160	18 4 36.4	8.622	18	9 39 30.57	1.8489	10 1 8.3	11.236
19	8 9 12.05	2.0115	17 55 56.9	8.693	19	9 41 21.44	1.8467	9 49 53.0	11.273
20	8 11 12.61	2.0071	17 47 13.2	8.765	20	9 43 12.17	1.8444	9 38 35.5	11.310
21	8 13 12.90	2.0026	17 38 25.1	8.838	21	9 45 2.77	1.8423	9 27 15.8	11.345
22	8 15 12.92	1.9982	17 29 32.7	8.908	22	9 46 53.25	1.8403	9 15 54.1	11.380
23	8 17 12.68	1.9938	+17 20 36.2	-8.976	23	9 48 43.60	1.8382	+ 9 4 30.2	-11.414
OCTOBER 9.					OCTOBER 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 19 12.18	1.9895	+17 11 35.6	-9.044	0	9 50 33.83	1.8363	+ 8 53 4.4	-11.447
1	8 21 11.42	1.9853	17 2 30.9	9.113	1	9 52 23.95	1.8343	8 41 36.6	11.480
2	8 23 10.41	1.9810	16 53 22.1	9.180	2	9 54 13.95	1.8324	8 30 6.8	11.513
3	8 25 9.14	1.9768	16 44 9.3	9.246	3	9 56 3.84	1.8306	8 18 35.1	11.544
4	8 27 7.62	1.9726	16 34 52.6	9.311	4	9 57 53.62	1.8288	8 7 1.5	11.575
5	8 29 5.85	1.9685	16 25 32.0	9.376	5	9 59 43.30	1.8272	7 55 26.1	11.604
6	8 31 3.84	1.9644	16 16 7.5	9.439	6	10 1 32.88	1.8256	7 43 49.0	11.634
7	8 33 1.58	1.9603	16 6 39.3	9.502	7	10 3 22.37	1.8240	7 32 10.0	11.663
8	8 34 59.08	1.9564	15 57 7.3	9.565	8	10 5 11.76	1.8224	7 20 29.4	11.691
9	8 36 56.35	1.9524	15 47 31.5	9.626	9	10 7 1.06	1.8210	7 8 47.1	11.719
10	8 38 53.37	1.9485	15 37 52.2	9.686	10	10 8 50.28	1.8196	6 57 3.1	11.746
11	8 40 50.17	1.9447	15 28 9.2	9.747	11	10 10 39.41	1.8182	6 45 17.6	11.772
12	8 42 46.73	1.9408	15 18 22.6	9.806	12	10 12 28.46	1.8169	6 33 30.5	11.798
13	8 44 43.06	1.9370	15 8 32.5	9.863	13	10 14 17.44	1.8157	6 21 41.9	11.823
14	8 46 39.17	1.9333	14 58 39.0	9.921	14	10 16 6.34	1.8145	6 9 51.8	11.847
15	8 48 35.06	1.9297	14 48 42.0	9.978	15	10 17 55.18	1.8133	5 58 0.3	11.870
16	8 50 30.73	1.9260	14 38 41.6	10.034	16	10 19 43.94	1.8123	5 46 7.4	11.893
17	8 52 26.18	1.9223	14 28 37.9	10.089	17	10 21 32.65	1.8113	5 34 13.2	11.915
18	8 54 21.41	1.9188	14 18 30.9	10.143	18	10 23 21.30	1.8103	5 22 17.6	11.938
19	8 56 16.44	1.9153	14 8 20.7	10.198	19	10 25 9.89	1.8094	5 10 20.7	11.958
20	8 58 11.25	1.9119	13 58 7.2	10.251	20	10 26 58.43	1.8085	4 58 22.7	11.978
21	9 0 5.87	1.9085	13 47 50.6	10.303	21	10 28 46.91	1.8078	4 46 23.4	11.998
22	9 2 0.27	1.9051	13 37 30.8	10.355	22	10 30 35.36	1.8071	4 34 22.9	12.018
23	9 3 54.48	1.9018	13 27 8.0	10.405	23	10 32 23.76	1.8063	4 22 21.3	12.035
24	9 5 48.49	1.8986	+13 16 42.2	-10.455	24	10 34 12.12	1.8058	+ 4 10 18.7	-12.053

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 12.					OCTOBER 14.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	10 34 12.12	1.8058	+4 10 18.7	-12.063	0	12 1 15.64	1.8434	-5 35 48.6	-12.100
1	10 36 0.45	1.8053	3 58 15.0	12.070	1	12 3 6.31	1.8457	5 47 54.1	12.083
2	10 37 48.75	1.8047	3 46 10.3	12.086	2	12 4 57.12	1.8479	5 59 58.6	12.065
3	10 39 37.01	1.8043	3 34 4.7	12.102	3	12 6 48.06	1.8501	6 12 1.9	12.047
4	10 41 25.26	1.8039	3 21 58.1	12.118	4	12 8 39.13	1.8524	6 24 4.2	12.028
5	10 43 13.48	1.8035	3 9 50.6	12.132	5	12 10 30.35	1.8548	6 36 5.3	12.008
6	10 45 1.68	1.8033	2 57 42.3	12.145	6	12 12 21.71	1.8573	6 48 5.2	11.987
7	10 46 49.87	1.8031	2 45 33.2	12.158	7	12 14 13.22	1.8598	7 0 3.7	11.965
8	10 48 38.05	1.8029	2 33 23.3	12.171	8	12 16 4.88	1.8623	7 12 1.0	11.943
9	10 50 26.22	1.8028	2 21 12.7	12.183	9	12 17 56.69	1.8648	7 23 56.9	11.920
10	10 52 14.39	1.8028	2 9 1.4	12.194	10	12 19 48.66	1.8675	7 35 51.4	11.896
11	10 54 2.56	1.8028	1 56 49.4	12.204	11	12 21 40.79	1.8702	7 47 44.4	11.871
12	10 55 50.73	1.8029	1 44 36.9	12.213	12	12 23 33.08	1.8729	7 59 35.9	11.845
13	10 57 38.91	1.8030	1 32 23.8	12.223	13	12 25 25.54	1.8758	8 11 25.8	11.819
14	10 59 27.09	1.8032	1 20 10.2	12.232	14	12 27 18.17	1.8786	8 23 14.2	11.792
15	11 1 15.29	1.8035	1 7 56.0	12.239	15	12 29 10.97	1.8814	8 35 0.8	11.763
16	11 3 3.51	1.8038	0 55 41.5	12.246	16	12 31 3.94	1.8843	8 46 45.8	11.735
17	11 4 51.75	1.8042	0 43 26.5	12.253	17	12 32 57.09	1.8874	8 58 29.0	11.704
18	11 6 40.01	1.8045	0 31 11.2	12.258	18	12 34 50.43	1.8904	9 10 10.3	11.673
19	11 8 28.29	1.8050	0 18 55.5	12.263	19	12 36 43.94	1.8935	9 21 49.8	11.643
20	11 10 16.61	1.8056	+0 6 39.6	12.268	20	12 38 37.65	1.8968	9 33 27.4	11.610
21	11 12 4.96	1.8062	-0 5 36.6	12.271	21	12 40 31.55	1.8998	9 45 3.0	11.577
22	11 13 53.35	1.8068	0 17 52.9	12.274	22	12 42 25.63	1.9031	9 56 36.6	11.543
23	11 15 41.78	1.8075	-0 30 9.5	-12.277	23	12 44 19.92	1.9064	-10 8 8.1	-11.508
OCTOBER 13.					OCTOBER 15.				
0	11 17 30.25	1.8063	-0 42 26.1	-12.278	0	12 46 14.40	1.9098	-10 19 37.5	-11.472
1	11 19 18.77	1.8091	0 54 42.8	12.278	1	12 48 9.09	1.9132	10 31 4.7	11.435
2	11 21 7.34	1.8100	1 6 59.5	12.278	2	12 50 3.98	1.9165	10 42 29.7	11.398
3	11 22 55.97	1.8109	1 19 16.2	12.278	3	12 51 59.07	1.9200	10 53 52.4	11.359
4	11 24 44.65	1.8118	1 31 32.9	12.277	4	12 53 54.38	1.9236	11 5 12.8	11.319
5	11 26 33.39	1.8129	1 43 49.4	12.275	5	12 55 49.90	1.9271	11 16 30.7	11.278
6	11 28 22.20	1.8141	1 56 5.9	12.273	6	12 57 45.63	1.9307	11 27 46.2	11.238
7	11 30 11.08	1.8153	2 8 22.1	12.269	7	12 59 41.58	1.9344	11 38 59.2	11.196
8	11 32 0.03	1.8164	2 20 38.2	12.265	8	13 1 37.76	1.9381	11 50 9.7	11.153
9	11 33 49.05	1.8177	2 32 53.9	12.260	9	13 3 34.15	1.9418	12 1 17.5	11.108
10	11 35 38.15	1.8190	2 45 9.4	12.255	10	13 5 30.78	1.9457	12 12 22.7	11.063
11	11 37 27.33	1.8204	2 57 24.5	12.248	11	13 7 27.63	1.9494	12 23 25.1	11.017
12	11 39 16.60	1.8219	3 9 39.2	12.242	12	13 9 24.71	1.9533	12 34 24.7	10.970
13	11 41 5.96	1.8233	3 21 53.5	12.233	13	13 11 22.02	1.9572	12 45 21.5	10.923
14	11 42 55.40	1.8248	3 34 7.2	12.225	14	13 13 19.57	1.9612	12 56 15.4	10.874
15	11 44 44.94	1.8265	3 46 20.5	12.217	15	13 15 17.36	1.9653	13 7 6.4	10.824
16	11 46 34.58	1.8283	3 58 33.2	12.206	16	13 17 15.40	1.9693	13 17 54.3	10.773
17	11 48 24.33	1.8299	4 10 45.2	12.195	17	13 19 13.67	1.9733	13 28 39.2	10.723
18	11 50 14.17	1.8317	4 22 56.6	12.184	18	13 21 12.19	1.9774	13 39 21.0	10.670
19	11 52 4.13	1.8335	4 35 7.3	12.173	19	13 23 10.96	1.9815	13 49 59.6	10.617
20	11 53 54.19	1.8354	4 47 17.3	12.159	20	13 25 9.97	1.9858	14 0 35.0	10.562
21	11 55 44.38	1.8373	4 59 26.4	12.145	21	13 27 9.25	1.9900	14 11 7.0	10.506
22	11 57 34.67	1.8393	5 11 34.7	12.131	22	13 29 8.77	1.9942	14 21 35.7	10.450
23	11 59 25.10	1.8414	5 23 42.1	12.116	23	13 31 8.55	1.9985	14 32 1.0	10.393
24	12 1 15.64	1.8434	-5 35 48.6	-12.100	24	13 33 8.59	2.0028	-14 42 22.8	-10.334

GREENWICH MEAN TIME.

Hour.	Right Ascension	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension	Var. per Min.	Declination.	Var. per Min.
OCTOBER 16.					OCTOBER 18.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	13 33 8.59	2.0028	-14 42 22.8	-10.334	0	15 14 40.73	2.2308	-21 31 59.0	-6.340
1	13 35 8.89	2.0072	14 52 41.1	10.275	1	15 16 54.72	2.2354	21 38 16.2	6.232
2	13 37 9.45	2.0116	15 2 55.8	10.215	2	15 19 8.98	2.2401	21 44 26.8	6.123
3	13 39 10.28	2.0160	15 13 6.9	10.153	3	15 21 23.53	2.2448	21 50 30.9	6.013
4	13 41 11.37	2.0205	15 23 14.2	10.091	4	15 23 38.35	2.2493	21 56 28.3	5.902
5	13 43 12.74	2.0250	15 33 17.8	10.028	5	15 25 53.44	2.2538	22 2 19.1	5.791
6	13 45 14.37	2.0294	15 43 17.5	9.963	6	15 28 8.81	2.2583	22 8 3.2	5.678
7	13 47 16.27	2.0340	15 53 13.4	9.898	7	15 30 24.44	2.2628	22 13 40.4	5.563
8	13 49 18.45	2.0386	16 3 5.3	9.832	8	15 32 40.34	2.2673	22 19 10.8	5.449
9	13 51 20.90	2.0432	16 12 53.2	9.764	9	15 34 56.51	2.2718	22 24 34.3	5.333
10	13 53 23.63	2.0478	16 22 37.0	9.696	10	15 37 12.95	2.2761	22 29 50.8	5.218
11	13 55 26.64	2.0524	16 32 16.7	9.627	11	15 39 29.64	2.2803	22 35 0.4	5.100
12	13 57 29.92	2.0571	16 41 52.2	9.557	12	15 41 46.59	2.2847	22 40 2.8	4.981
13	13 59 33.49	2.0618	16 51 23.5	9.485	13	15 44 3.80	2.2889	22 44 58.1	4.863
14	14 1 37.34	2.0665	17 0 50.4	9.413	14	15 46 21.26	2.2932	22 49 46.3	4.743
15	14 3 41.47	2.0712	17 10 13.0	9.339	15	15 48 38.98	2.2973	22 54 27.3	4.623
16	14 5 45.88	2.0760	17 19 31.1	9.265	16	15 50 56.94	2.3013	22 59 1.0	4.501
17	14 7 50.59	2.0808	17 28 44.8	9.189	17	15 53 15.14	2.3054	23 3 27.4	4.378
18	14 9 55.58	2.0855	17 37 53.8	9.113	18	15 55 33.59	2.3095	23 7 46.4	4.255
19	14 12 0.85	2.0903	17 46 58.3	9.035	19	15 57 52.28	2.3134	23 11 58.0	4.131
20	14 14 6.42	2.0952	17 55 58.0	8.956	20	16 0 11.20	2.3173	23 16 2.1	4.006
21	14 16 12.27	2.1000	18 4 53.0	8.877	21	16 2 30.35	2.3211	23 19 58.7	3.881
22	14 18 18.42	2.1048	18 13 43.2	8.797	22	16 4 49.73	2.3249	23 23 47.8	3.754
23	14 20 24.85	2.1097	-18 22 28.6	-8.715	23	16 7 9.34	2.3287	-23 27 29.2	-3.627
OCTOBER 17.					OCTOBER 19.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	14 22 31.58	2.1146	-18 31 9.0	-8.632	0	16 9 29.17	2.3323	-23 31 3.0	-3.499
1	14 24 38.60	2.1194	18 39 44.4	8.548	1	16 11 49.22	2.3359	23 34 29.1	3.371
2	14 26 45.91	2.1243	18 48 14.8	8.463	2	16 14 9.48	2.3394	23 37 47.5	3.242
3	14 28 53.51	2.1292	18 56 40.0	8.378	3	16 16 29.95	2.3428	23 40 58.1	3.111
4	14 31 1.41	2.1341	19 5 0.1	8.291	4	16 18 50.62	2.3463	23 44 0.8	2.980
5	14 33 9.60	2.1389	19 13 14.9	8.203	5	16 21 11.51	2.3497	23 46 55.7	2.849
6	14 35 18.08	2.1438	19 21 24.4	8.114	6	16 23 32.58	2.3529	23 49 42.7	2.718
7	14 37 26.86	2.1488	19 29 28.6	8.024	7	16 25 53.86	2.3563	23 52 21.8	2.585
8	14 39 35.93	2.1537	19 37 27.3	7.933	8	16 28 15.33	2.3593	23 54 52.9	2.451
9	14 41 45.30	2.1586	19 45 20.5	7.841	9	16 30 36.98	2.3623	23 57 15.9	2.317
10	14 43 54.96	2.1634	19 53 8.2	7.748	10	16 32 58.81	2.3654	23 59 30.9	2.183
11	14 46 4.91	2.1683	20 0 50.3	7.654	11	16 35 20.83	2.3683	24 1 37.8	2.048
12	14 48 15.16	2.1733	20 8 26.7	7.559	12	16 37 43.01	2.3712	24 3 36.6	1.912
13	14 50 25.70	2.1781	20 15 57.4	7.463	13	16 40 5.37	2.3740	24 5 27.2	1.776
14	14 52 36.53	2.1829	20 23 22.3	7.366	14	16 42 27.89	2.3766	24 7 9.7	1.639
15	14 54 47.65	2.1878	20 30 41.3	7.268	15	16 44 50.56	2.3793	24 8 43.9	1.501
16	14 56 59.07	2.1927	20 37 54.4	7.168	16	16 47 13.40	2.3818	24 10 9.8	1.363
17	14 59 10.77	2.1974	20 45 1.5	7.068	17	16 49 36.38	2.3843	24 11 27.5	1.226
18	15 1 22.76	2.2023	20 52 2.6	6.968	18	16 51 59.51	2.3867	24 12 36.9	1.087
19	15 3 35.05	2.2071	20 58 57.6	6.865	19	16 54 22.78	2.3890	24 13 37.9	0.947
20	15 5 47.61	2.2118	21 5 46.4	6.762	20	16 56 46.19	2.3913	24 14 30.5	0.808
21	15 8 0.47	2.2167	21 12 29.0	6.658	21	16 59 9.73	2.3934	24 15 14.8	0.668
22	15 10 13.61	2.2213	21 19 5.4	6.553	22	17 1 33.40	2.3955	24 15 50.7	0.528
23	15 12 27.03	2.2260	21 25 35.4	6.447	23	17 3 57.19	2.3974	24 16 18.1	0.386
24	15 14 40.73	2.2308	-21 31 59.0	-6.340	24	17 6 21.09	2.3993	-24 16 37.0	-0.245

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 20.					OCTOBER 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 6 21.09	2.3993	-24 16 37.0	-0.245	0	19 2 8.44	2.3958	-21 43 50.7	+ 6.556
1	17 8 45.11	2.4012	24 16 47.5	-0.104	1	19 4 32.13	2.3940	21 37 13.3	6.690
2	17 11 9.23	2.4028	24 16 49.5	+0.088	2	19 6 55.72	2.3923	21 30 27.9	6.823
3	17 13 33.45	2.4045	24 16 42.9	0.180	3	19 9 19.20	2.3908	21 23 34.5	6.957
4	17 15 57.77	2.4062	24 16 27.9	0.323	4	19 11 42.56	2.3884	21 16 33.1	7.089
5	17 18 22.19	2.4076	24 16 4.2	0.465	5	19 14 5.81	2.3865	21 9 23.8	7.220
6	17 20 46.68	2.4089	24 15 32.1	0.608	6	19 16 28.94	2.3845	21 2 6.7	7.351
7	17 23 11.26	2.4103	24 14 51.3	0.751	7	19 18 51.95	2.3825	20 54 41.7	7.483
8	17 25 35.92	2.4115	24 14 2.0	0.894	8	19 21 14.84	2.3805	20 47 8.8	7.612
9	17 28 0.64	2.4127	24 13 4.0	1.038	9	19 23 37.61	2.3783	20 39 28.3	7.740
10	17 30 25.44	2.4138	24 11 57.5	1.181	10	19 26 0.24	2.3762	20 31 40.0	7.868
11	17 32 50.29	2.4147	24 10 42.3	1.325	11	19 28 22.75	2.3740	20 23 44.1	7.996
12	17 35 15.20	2.4156	24 9 18.5	1.468	12	19 30 45.12	2.3718	20 15 40.5	8.123
13	17 37 40.16	2.4164	24 7 46.1	1.612	13	19 33 7.36	2.3696	20 7 29.4	8.248
14	17 40 5.17	2.4172	24 6 5.0	1.758	14	19 35 29.47	2.3673	19 59 10.7	8.373
15	17 42 30.22	2.4178	24 4 15.2	1.901	15	19 37 51.44	2.3650	19 50 44.6	8.496
16	17 44 55.30	2.4183	24 2 16.9	2.044	16	19 40 13.27	2.3628	19 42 11.0	8.621
17	17 47 20.41	2.4188	24 0 9.9	2.189	17	19 42 34.97	2.3604	19 33 30.1	8.743
18	17 49 45.55	2.4192	23 57 54.2	2.333	18	19 44 56.52	2.3580	19 24 41.8	8.866
19	17 52 10.71	2.4194	23 55 29.9	2.478	19	19 47 17.93	2.3556	19 15 46.2	8.986
20	17 54 35.88	2.4197	23 52 56.9	2.622	20	19 49 39.19	2.3533	19 6 43.5	9.106
21	17 57 1.07	2.4198	23 50 15.3	2.765	21	19 52 0.32	2.3508	18 57 33.5	9.226
22	17 59 26.26	2.4198	23 47 25.1	2.909	22	19 54 21.29	2.3483	18 48 16.4	9.343
23	18 1 51.45	2.4198	-23 44 26.2	+3.053	23	19 56 42.12	2.3459	-18 38 52.3	+ 9.461
OCTOBER 21.					OCTOBER 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 4 16.64	2.4198	-23 41 18.7	+3.197	0	19 59 2.80	2.3434	-18 29 21.1	+ 9.578
1	18 6 41.82	2.4196	23 38 2.6	3.340	1	20 1 23.33	2.3410	18 19 43.0	9.698
2	18 9 6.99	2.4193	23 34 37.9	3.483	2	20 3 43.72	2.3386	18 9 58.0	9.807
3	18 11 32.14	2.4190	23 31 4.6	3.627	3	20 6 3.96	2.3360	18 0 6.2	9.921
4	18 13 57.27	2.4185	23 27 22.7	3.770	4	20 8 24.04	2.3335	17 50 7.5	10.033
5	18 16 22.36	2.4180	23 23 32.2	3.913	5	20 10 43.98	2.3310	17 40 2.2	10.144
6	18 18 47.43	2.4175	23 19 33.2	4.055	6	20 13 3.76	2.3285	17 29 50.2	10.255
7	18 21 12.46	2.4168	23 15 25.6	4.198	7	20 15 23.40	2.3260	17 19 31.6	10.365
8	18 23 37.45	2.4162	23 11 9.5	4.339	8	20 17 42.88	2.3234	17 9 6.4	10.473
9	18 26 2.40	2.4153	23 6 44.9	4.480	9	20 20 2.21	2.3210	16 58 34.8	10.580
10	18 28 27.29	2.4144	23 2 11.9	4.622	10	20 22 21.40	2.3185	16 47 56.8	10.687
11	18 30 52.13	2.4136	22 57 30.3	4.763	11	20 24 40.43	2.3159	16 37 12.4	10.793
12	18 33 16.92	2.4126	22 52 40.3	4.903	12	20 26 59.31	2.3135	16 26 21.7	10.897
13	18 35 41.64	2.4115	22 47 41.9	5.043	13	20 29 18.05	2.3110	16 15 24.8	11.000
14	18 38 6.30	2.4104	22 42 35.1	5.183	14	20 31 36.63	2.3086	16 4 21.7	11.102
15	18 40 30.89	2.4092	22 37 19.9	5.323	15	20 33 55.08	2.3062	15 53 12.6	11.203
16	18 42 55.40	2.4079	22 31 56.3	5.463	16	20 36 13.37	2.3037	15 41 57.4	11.303
17	18 45 19.84	2.4067	22 26 24.4	5.600	17	20 38 31.52	2.3013	15 30 36.3	11.401
18	18 47 44.20	2.4053	22 20 44.3	5.738	18	20 40 49.52	2.2988	15 19 9.3	11.499
19	18 50 8.47	2.4038	22 14 55.8	5.877	19	20 43 7.38	2.2965	15 7 36.4	11.596
20	18 52 32.65	2.4023	22 8 59.1	6.013	20	20 45 25.10	2.2942	14 55 57.8	11.691
21	18 54 56.75	2.4008	22 2 54.3	6.149	21	20 47 42.68	2.2918	14 44 13.5	11.785
22	18 57 20.74	2.3991	21 56 41.2	6.286	22	20 50 0.11	2.2894	14 32 23.6	11.878
23	18 59 44.64	2.3975	21 50 20.0	6.421	23	20 52 17.41	2.2872	14 20 28.1	11.971
24	19 2 8.44	2.3958	-21 43 50.7	+6.556	24	20 54 34.57	2.2848	-14 8 27.1	+12.062

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 24.					OCTOBER 26.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 54 34.57	2.2848	-14 8 27.1	+12.062	0	22 42 20.73	2.2242	-3 9 7.7	+14.885
1	20 56 51.59	2.2826	13 56 20.7	12.151	1	22 44 34.18	2.2242	2 54 13.9	14.908
2	20 59 8.48	2.2804	13 44 9.0	12.239	2	22 46 47.63	2.2243	2 39 18.7	14.932
3	21 1 25.24	2.2783	13 31 52.0	12.327	3	22 49 1.09	2.2244	2 24 22.1	14.953
4	21 3 41.87	2.2760	13 19 29.8	12.413	4	22 51 14.56	2.2246	2 9 24.4	14.971
5	21 5 58.36	2.2738	13 7 2.4	12.498	5	22 53 28.04	2.2249	1 54 25.6	14.989
6	21 8 14.73	2.2718	12 54 30.1	12.581	6	22 55 41.55	2.2253	1 39 25.7	15.006
7	21 10 30.98	2.2698	12 41 52.7	12.664	7	22 57 55.08	2.2257	1 24 24.9	15.020
8	21 12 47.10	2.2677	12 29 10.4	12.745	8	23 0 8.63	2.2261	1 9 23.3	15.033
9	21 15 3.10	2.2657	12 16 23.3	12.824	9	23 2 22.21	2.2267	0 54 21.0	15.044
10	21 17 18.98	2.2637	12 3 31.5	12.903	10	23 4 35.83	2.2273	0 39 18.0	15.054
11	21 19 34.74	2.2618	11 50 34.9	12.981	11	23 6 49.48	2.2279	0 24 14.5	15.063
12	21 21 50.39	2.2599	11 37 33.8	13.057	12	23 9 3.18	2.2287	-0 9 10.5	15.069
13	21 24 5.93	2.2580	11 24 28.1	13.132	13	23 11 16.92	2.2294	+0 5 53.8	15.074
14	21 26 21.35	2.2562	11 11 18.0	13.205	14	23 13 30.71	2.2303	0 20 58.4	15.078
15	21 28 36.67	2.2544	10 58 3.5	13.277	15	23 15 44.55	2.2312	0 36 3.1	15.079
16	21 30 51.88	2.2527	10 44 44.8	13.348	16	23 17 58.45	2.2321	0 51 7.9	15.080
17	21 33 6.99	2.2511	10 31 21.8	13.418	17	23 20 12.40	2.2331	1 6 12.7	15.078
18	21 35 22.01	2.2494	10 17 54.7	13.486	18	23 22 26.42	2.2343	1 21 17.3	15.076
19	21 37 36.92	2.2478	10 4 23.5	13.553	19	23 24 40.51	2.2353	1 36 21.8	15.072
20	21 39 51.74	2.2463	9 50 48.4	13.618	20	23 26 54.66	2.2365	1 51 25.9	15.064
21	21 42 6.47	2.2448	9 37 9.4	13.683	21	23 29 8.89	2.2378	2 6 29.5	15.057
22	21 44 21.11	2.2433	9 23 26.5	13.746	22	23 31 23.20	2.2391	2 21 32.7	15.048
23	21 46 35.66	2.2418	-9 9 39.9	+13.807	23	23 33 37.58	2.2404	+2 36 35.3	+15.037
OCTOBER 25.					OCTOBER 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 48 50.13	2.2405	-8 55 49.7	+13.867	0	23 35 52.05	2.2419	+2 51 37.1	+15.023
1	21 51 4.52	2.2392	8 41 55.9	13.926	1	23 38 6.61	2.2433	3 6 38.1	15.009
2	21 53 18.83	2.2379	8 27 58.6	13.983	2	23 40 21.25	2.2446	3 21 38.2	14.993
3	21 55 33.07	2.2366	8 13 57.9	14.039	3	23 42 35.99	2.2466	3 36 37.3	14.976
4	21 57 47.24	2.2356	7 59 53.9	14.093	4	23 44 50.83	2.2482	3 51 35.3	14.957
5	22 0 1.34	2.2344	7 45 46.7	14.147	5	23 47 5.77	2.2498	4 6 32.1	14.936
6	22 2 15.37	2.2333	7 31 36.3	14.199	6	23 49 20.81	2.2516	4 21 27.6	14.913
7	22 4 29.34	2.2324	7 17 22.8	14.250	7	23 51 35.96	2.2533	4 36 21.6	14.888
8	22 6 43.26	2.2315	7 3 6.3	14.298	8	23 53 51.21	2.2553	4 51 14.1	14.863
9	22 8 57.12	2.2306	6 48 47.0	14.346	9	23 56 6.59	2.2573	5 6 5.1	14.835
10	22 11 10.93	2.2298	6 34 24.8	14.393	10	23 58 22.08	2.2592	5 20 54.3	14.806
11	22 13 24.69	2.2289	6 19 59.9	14.438	11	0 0 37.69	2.2612	5 35 41.7	14.774
12	22 15 38.40	2.2282	6 5 32.3	14.481	12	0 2 53.42	2.2633	5 50 27.2	14.742
13	22 17 52.07	2.2276	5 51 2.2	14.523	13	0 5 9.28	2.2654	6 5 10.7	14.707
14	22 20 5.71	2.2270	5 36 29.6	14.563	14	0 7 25.27	2.2676	6 19 52.0	14.670
15	22 22 19.31	2.2264	5 21 54.7	14.601	15	0 9 41.39	2.2698	6 34 31.1	14.633
16	22 24 32.88	2.2259	5 7 17.5	14.639	16	0 11 57.64	2.2720	6 49 8.0	14.593
17	22 26 46.42	2.2255	4 52 38.0	14.675	17	0 14 14.03	2.2743	7 3 42.3	14.552
18	22 28 59.94	2.2251	4 37 56.5	14.709	18	0 16 30.56	2.2768	7 18 14.2	14.510
19	22 31 13.43	2.2248	4 23 12.9	14.743	19	0 18 47.24	2.2792	7 32 43.5	14.465
20	22 33 26.91	2.2246	4 8 27.4	14.774	20	0 21 4.06	2.2816	7 47 10.0	14.419
21	22 35 40.38	2.2243	3 53 40.0	14.804	21	0 23 21.03	2.2842	8 1 33.8	14.372
22	22 37 53.83	2.2242	3 38 50.9	14.833	22	0 25 38.16	2.2867	8 15 54.6	14.322
23	22 40 7.28	2.2242	3 24 0.1	14.860	23	0 27 55.43	2.2892	8 30 12.4	14.270
24	22 42 20.73	2.2242	-3 9 7.7	+14.885	24	0 30 12.86	2.2918	+8 44 27.0	+14.217

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 28.					OCTOBER 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 30 12.86	2.2918	+ 8 44 27.0	+14.217	0	2 23 39.49	2.4358	+18 35 7.4	+9.812
1	0 32 30.45	2.2945	8 58 38.4	14.163	1	2 26 5.72	2.4384	18 44 52.3	9.686
2	0 34 48.20	2.2972	9 12 46.5	14.107	2	2 28 32.10	2.4410	18 54 29.7	9.558
3	0 37 6.11	2.2999	9 26 51.2	14.049	3	2 30 58.64	2.4437	19 3 59.3	9.430
4	0 39 24.19	2.3027	9 40 52.4	13.989	4	2 33 25.34	2.4463	19 13 21.3	9.300
5	0 41 42.43	2.3054	9 54 49.9	13.928	5	2 35 52.18	2.4489	19 22 35.3	9.169
6	0 44 0.84	2.3083	10 8 43.7	13.864	6	2 38 19.17	2.4511	19 31 41.6	9.038
7	0 46 19.42	2.3112	10 22 33.6	13.800	7	2 40 46.31	2.4534	19 40 39.8	8.904
8	0 48 38.18	2.3141	10 36 19.7	13.734	8	2 43 13.58	2.4557	19 49 30.1	8.771
9	0 50 57.11	2.3170	10 50 1.7	13.666	9	2 45 40.99	2.4579	19 58 12.3	8.637
10	0 53 16.22	2.3199	11 3 39.6	13.597	10	2 48 8.53	2.4601	20 6 46.5	8.501
11	0 55 35.50	2.3228	11 17 13.3	13.525	11	2 50 36.20	2.4623	20 15 12.4	8.363
12	0 57 54.96	2.3258	11 30 42.6	13.452	12	2 53 4.00	2.4643	20 23 30.1	8.226
13	1 0 14.60	2.3289	11 44 7.5	13.378	13	2 55 31.92	2.4663	20 31 39.5	8.088
14	1 2 34.43	2.3320	11 57 27.9	13.301	14	2 57 59.95	2.4682	20 39 40.6	7.948
15	1 4 54.44	2.3350	12 10 43.6	13.223	15	3 0 28.10	2.4700	20 47 33.2	7.808
16	1 7 14.63	2.3381	12 23 54.7	13.144	16	3 2 56.35	2.4718	20 55 17.5	7.667
17	1 9 35.01	2.3413	12 37 0.9	13.063	17	3 5 24.71	2.4735	21 2 53.2	7.524
18	1 11 55.58	2.3443	12 50 2.2	12.981	18	3 7 53.17	2.4751	21 10 20.4	7.383
19	1 14 16.33	2.3474	13 2 58.6	12.897	19	3 10 21.72	2.4767	21 17 39.1	7.239
20	1 16 37.27	2.3505	13 15 49.8	12.811	20	3 12 50.37	2.4782	21 24 49.1	7.094
21	1 18 58.39	2.3537	13 28 35.9	12.723	21	3 15 19.10	2.4794	21 31 50.4	6.950
22	1 21 19.71	2.3568	13 41 16.6	12.634	22	3 17 47.90	2.4808	21 38 43.1	6.805
23	1 23 41.21	2.3599	+13 53 52.0	+12.544	23	3 20 16.79	2.4820	+21 45 27.0	+6.658
OCTOBER 29.					OCTOBER 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 26 2.90	2.3632	+14 6 21.9	+12.453	0	3 22 45.74	2.4831	+21 52 2.1	+6.512
1	1 28 24.79	2.3663	14 18 46.3	12.358	1	3 25 14.76	2.4842	21 58 28.4	6.365
2	1 30 46.86	2.3695	14 31 4.9	12.263	2	3 27 43.84	2.4851	22 4 45.9	6.218
3	1 33 9.13	2.3727	14 43 17.9	12.167	3	3 30 12.97	2.4859	22 10 54.5	6.068
4	1 35 31.58	2.3758	14 55 25.0	12.068	4	3 32 42.15	2.4868	22 16 54.1	5.919
5	1 37 54.22	2.3790	15 7 26.1	11.968	5	3 35 11.38	2.4874	22 22 44.8	5.771
6	1 40 17.06	2.3822	15 19 21.2	11.868	6	3 37 40.64	2.4880	22 28 26.6	5.621
7	1 42 40.08	2.3853	15 31 10.3	11.766	7	3 40 9.94	2.4885	22 33 59.3	5.471
8	1 45 3.30	2.3885	15 42 53.1	11.661	8	3 42 39.26	2.4888	22 39 23.1	5.321
9	1 47 26.70	2.3916	15 54 29.6	11.556	9	3 45 8.60	2.4892	22 44 37.8	5.170
10	1 49 50.29	2.3947	16 5 59.8	11.449	10	3 47 37.96	2.4894	22 49 43.5	5.018
11	1 52 14.06	2.3978	16 17 23.5	11.341	11	3 50 7.33	2.4895	22 54 40.0	4.867
12	1 54 38.02	2.4009	16 28 40.7	11.232	12	3 52 36.70	2.4895	22 59 27.5	4.716
13	1 57 2.17	2.4039	16 39 51.3	11.120	13	3 55 6.07	2.4894	23 4 5.9	4.563
14	1 59 26.49	2.4069	16 50 55.1	11.008	14	3 57 35.43	2.4892	23 8 35.1	4.411
15	2 1 51.00	2.4100	17 1 52.2	10.894	15	4 0 4.77	2.4889	23 12 55.2	4.259
16	2 4 15.69	2.4130	17 12 42.4	10.778	16	4 2 34.10	2.4886	23 17 6.2	4.107
17	2 6 40.56	2.4160	17 23 25.6	10.662	17	4 5 3.40	2.4880	23 21 8.0	3.954
18	2 9 5.61	2.4189	17 34 1.8	10.544	18	4 7 32.66	2.4873	23 25 0.7	3.802
19	2 11 30.83	2.4218	17 44 30.9	10.426	19	4 10 1.88	2.4867	23 28 44.2	3.649
20	2 13 56.22	2.4247	17 54 52.9	10.306	20	4 12 31.06	2.4858	23 32 18.6	3.496
21	2 16 21.79	2.4275	18 5 7.6	10.183	21	4 15 0.18	2.4849	23 35 43.7	3.343
22	2 18 47.52	2.4303	18 15 14.9	10.061	22	4 17 29.25	2.4840	23 38 59.8	3.191
23	2 21 13.42	2.4331	18 25 14.9	9.938	23	4 19 58.26	2.4828	23 42 6.6	3.038
24	2 23 39.49	2.4358	+18 35 7.4	+9.812	24	4 22 27.19	2.4816	+23 45 4.3	+2.885

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 1.					NOVEMBER 3.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	4 22 27.19	2.4816	+23 45 4.3	+2.885	0	6 18 19.43	2.3148	+23 15 6.9	-3.887
1	4 24 56.05	2.4803	23 47 52.8	2.783	1	6 20 38.16	2.3096	23 11 10.0	4.008
2	4 27 24.82	2.4788	23 50 32.2	2.581	2	6 22 56.58	2.3043	23 7 5.9	4.129
3	4 29 53.50	2.4773	23 53 2.5	2.428	3	6 25 14.68	2.2991	23 2 54.5	4.250
4	4 32 22.09	2.4757	23 55 23.6	2.276	4	6 27 32.47	2.2938	22 58 35.9	4.369
5	4 34 50.58	2.4739	23 57 35.6	2.124	5	6 29 49.94	2.2884	22 54 10.2	4.487
6	4 37 18.96	2.4720	23 59 38.5	1.973	6	6 32 7.08	2.2831	22 49 37.5	4.604
7	4 39 47.22	2.4701	24 1 32.3	1.822	7	6 34 23.91	2.2778	22 44 57.7	4.720
8	4 42 15.37	2.4681	24 3 17.1	1.671	8	6 36 40.41	2.2723	22 40 11.1	4.835
9	4 44 43.39	2.4658	24 4 52.8	1.520	9	6 38 56.59	2.2669	22 35 17.5	4.950
10	4 47 11.27	2.4636	24 6 19.5	1.369	10	6 41 12.44	2.2614	22 30 17.1	5.063
11	4 49 39.02	2.4613	24 7 37.1	1.219	11	6 43 27.96	2.2559	22 25 10.0	5.174
12	4 52 6.63	2.4588	24 8 45.8	1.070	12	6 45 43.15	2.2504	22 19 56.2	5.285
13	4 54 34.08	2.4563	24 9 45.5	0.921	13	6 47 58.01	2.2449	22 14 35.8	5.395
14	4 57 1.38	2.4537	24 10 36.3	0.772	14	6 50 12.54	2.2393	22 9 8.8	5.504
15	4 59 28.52	2.4509	24 11 18.1	0.623	15	6 52 26.73	2.2338	22 3 35.3	5.612
16	5 1 55.49	2.4480	24 11 51.1	0.476	16	6 54 40.59	2.2283	21 57 55.4	5.718
17	5 4 22.28	2.4451	24 12 15.2	0.328	17	6 56 54.12	2.2227	21 52 9.1	5.825
18	5 6 48.90	2.4421	24 12 30.5	0.182	18	6 59 7.31	2.2171	21 46 16.4	5.929
19	5 9 15.33	2.4389	24 12 37.0	+0.036	19	7 1 20.17	2.2114	21 40 17.6	6.033
20	5 11 41.57	2.4357	24 12 34.8	-0.110	20	7 3 32.68	2.2058	21 34 12.5	6.136
21	5 14 7.61	2.4324	24 12 23.8	0.256	21	7 5 44.87	2.2003	21 28 1.3	6.237
22	5 16 33.46	2.4290	24 12 4.1	0.400	22	7 7 56.71	2.1946	21 21 44.1	6.338
23	5 18 59.09	2.4255	+24 11 35.8	-0.548	23	7 10 8.22	2.1890	+21 15 20.8	-6.438
NOVEMBER 2.					NOVEMBER 4.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	5 21 24.52	2.4220	+24 10 58.9	-0.687	0	7 12 19.39	2.1833	+21 8 51.6	-6.536
1	5 23 49.73	2.4183	24 10 13.4	0.829	1	7 14 30.22	2.1778	21 2 16.5	6.633
2	5 26 14.72	2.4146	24 9 19.4	0.971	2	7 16 40.72	2.1722	20 55 35.7	6.729
3	5 28 39.48	2.4108	24 8 16.9	1.113	3	7 18 50.88	2.1666	20 48 49.0	6.825
4	5 31 4.01	2.4069	24 7 5.9	1.253	4	7 21 0.71	2.1610	20 41 56.7	6.919
5	5 33 28.31	2.4029	24 5 46.5	1.393	5	7 23 10.20	2.1553	20 34 58.7	7.013
6	5 35 52.36	2.3988	24 4 18.8	1.531	6	7 25 19.35	2.1498	20 27 55.2	7.104
7	5 38 16.17	2.3948	24 2 42.8	1.669	7	7 27 28.17	2.1443	20 20 46.2	7.195
8	5 40 39.73	2.3905	24 0 58.5	1.808	8	7 29 36.66	2.1387	20 13 31.8	7.286
9	5 43 3.03	2.3862	23 59 5.9	1.944	9	7 31 44.81	2.1331	20 6 11.9	7.375
10	5 45 26.07	2.3818	23 57 5.2	2.079	10	7 33 52.63	2.1276	19 58 46.8	7.463
11	5 47 48.85	2.3775	23 54 56.4	2.214	11	7 36 0.12	2.1221	19 51 16.3	7.551
12	5 50 11.37	2.3731	23 52 39.5	2.348	12	7 38 7.28	2.1166	19 43 40.7	7.637
13	5 52 33.62	2.3685	23 50 14.6	2.482	13	7 40 14.11	2.1111	19 35 59.9	7.722
14	5 54 55.59	2.3638	23 47 41.7	2.613	14	7 42 20.61	2.1057	19 28 14.1	7.806
15	5 57 17.28	2.3592	23 45 1.0	2.745	15	7 44 26.79	2.1003	19 20 23.2	7.889
16	5 59 38.69	2.3545	23 42 12.3	2.876	16	7 46 32.64	2.0948	19 12 27.4	7.972
17	6 1 59.82	2.3497	23 39 15.9	3.006	17	7 48 38.17	2.0895	19 4 26.6	8.053
18	6 4 20.65	2.3448	23 36 11.7	3.134	18	7 50 43.38	2.0841	18 56 21.0	8.133
19	6 6 41.20	2.3400	23 32 59.8	3.262	19	7 52 48.26	2.0788	18 48 10.6	8.213
20	6 9 1.45	2.3350	23 29 40.3	3.388	20	7 54 52.83	2.0735	18 39 55.5	8.290
21	6 11 21.40	2.3300	23 26 13.2	3.515	21	7 56 57.08	2.0683	18 31 35.8	8.368
22	6 13 41.05	2.3249	23 22 38.5	3.640	22	7 59 1.02	2.0631	18 23 11.4	8.445
23	6 16 0.39	2.3198	23 18 56.4	3.763	23	8 1 4.65	2.0578	18 14 42.4	8.520
24	6 18 19.43	2.3148	+23 15 6.9	-3.887	24	8 3 7.96	2.0527	+18 6 9.0	-8.594

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 5.					NOVEMBER 7.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	8 3 7.96	2.0827	+18 6 9.0	-8.894	0	9 36 32.68	1.8503	+10 4 21.1	-11.178
1	8 5 10.97	2.0475	17 57 31.1	8.668	1	9 38 24.16	1.8567	9 53 9.6	11.208
2	8 7 13.66	2.0424	17 48 48.9	8.740	2	9 40 15.48	1.8541	9 41 56.1	11.243
3	8 9 16.06	2.0374	17 40 2.3	8.813	3	9 42 6.65	1.8516	9 30 40.5	11.277
4	8 11 18.15	2.0323	17 31 11.4	8.883	4	9 43 57.67	1.8491	9 19 22.9	11.310
5	8 13 19.94	2.0274	17 22 16.3	8.953	5	9 45 48.54	1.8466	9 8 3.3	11.343
6	8 15 21.44	2.0224	17 13 17.1	9.022	6	9 47 39.26	1.8443	8 56 41.7	11.375
7	8 17 22.63	2.0175	17 4 13.7	9.090	7	9 49 29.85	1.8420	8 45 18.3	11.406
8	8 19 23.54	2.0127	16 55 6.3	9.157	8	9 51 20.30	1.8398	8 33 53.0	11.437
9	8 21 24.15	2.0078	16 45 54.9	9.223	9	9 53 10.62	1.8375	8 22 25.9	11.467
10	8 23 24.48	2.0031	16 36 39.5	9.288	10	9 55 0.80	1.8354	8 10 57.0	11.497
11	8 25 24.52	1.9983	16 27 20.3	9.353	11	9 56 50.87	1.8334	7 59 26.3	11.525
12	8 27 24.28	1.9937	16 17 57.2	9.417	12	9 58 40.81	1.8314	7 47 54.0	11.553
13	8 29 23.76	1.9890	16 8 30.3	9.479	13	10 0 30.64	1.8295	7 36 20.0	11.580
14	8 31 22.96	1.9844	15 58 59.7	9.542	14	10 2 20.35	1.8276	7 24 44.4	11.607
15	8 33 21.89	1.9798	15 49 25.3	9.603	15	10 4 9.95	1.8258	7 13 7.2	11.633
16	8 35 20.54	1.9753	15 39 47.4	9.663	16	10 5 59.45	1.8241	7 1 28.5	11.658
17	8 37 18.93	1.9709	15 30 5.8	9.723	17	10 7 48.84	1.8224	6 49 48.2	11.684
18	8 39 17.05	1.9665	15 20 20.7	9.780	18	10 9 38.14	1.8206	6 38 6.4	11.708
19	8 41 14.91	1.9621	15 10 32.2	9.838	19	10 11 27.34	1.8193	6 26 23.3	11.731
20	8 43 12.50	1.9578	15 0 40.2	9.895	20	10 13 16.45	1.8178	6 14 38.7	11.755
21	8 45 9.84	1.9536	14 50 44.8	9.952	21	10 15 5.47	1.8163	6 2 52.7	11.777
22	8 47 6.93	1.9493	14 40 46.0	10.007	22	10 16 54.41	1.8150	5 51 5.5	11.798
23	8 49 3.76	1.9452	+14 30 44.0	-10.060	23	10 18 43.27	1.8138	+ 5 39 16.9	-11.820
NOVEMBER 6.					NOVEMBER 8.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	8 51 0.35	1.9411	+14 20 38.8	-10.113	0	10 20 32.06	1.8126	+ 5 27 27.1	-11.840
1	8 52 56.69	1.9370	14 10 30.4	10.167	1	10 22 20.78	1.8113	5 15 36.1	11.860
2	8 54 52.79	1.9331	14 0 18.8	10.219	2	10 24 9.42	1.8102	5 3 43.9	11.879
3	8 56 48.66	1.9292	13 50 4.1	10.270	3	10 25 58.00	1.8093	4 51 50.6	11.898
4	8 58 44.29	1.9252	13 39 46.4	10.320	4	10 27 46.53	1.8083	4 39 56.2	11.916
5	9 0 39.68	1.9213	13 29 25.7	10.370	5	10 29 34.99	1.8073	4 28 0.7	11.933
6	9 2 34.85	1.9177	13 19 2.0	10.419	6	10 31 23.40	1.8065	4 16 4.2	11.950
7	9 4 29.80	1.9139	13 8 35.4	10.468	7	10 33 11.77	1.8058	4 4 6.7	11.966
8	9 6 24.52	1.9102	12 58 5.9	10.515	8	10 35 0.09	1.8049	3 52 8.3	11.982
9	9 8 19.02	1.9066	12 47 33.6	10.561	9	10 36 48.36	1.8043	3 40 8.9	11.998
10	9 10 13.31	1.9030	12 36 58.6	10.607	10	10 38 36.60	1.8038	3 28 8.6	12.012
11	9 12 7.38	1.8995	12 26 20.8	10.653	11	10 40 24.81	1.8033	3 16 7.5	12.025
12	9 14 1.25	1.8961	12 15 40.3	10.697	12	10 42 12.99	1.8028	3 4 5.6	12.038
13	9 15 54.91	1.8927	12 4 57.2	10.740	13	10 44 1.15	1.8024	2 52 2.9	12.051
14	9 17 48.37	1.8894	11 54 11.5	10.783	14	10 45 49.28	1.8020	2 39 59.5	12.063
15	9 19 41.64	1.8861	11 43 23.3	10.825	15	10 47 37.39	1.8018	2 27 55.4	12.074
16	9 21 34.70	1.8828	11 32 32.5	10.867	16	10 49 25.49	1.8016	2 15 50.6	12.085
17	9 23 27.58	1.8798	11 21 39.3	10.908	17	10 51 13.58	1.8014	2 3 45.2	12.095
18	9 25 20.27	1.8767	11 10 43.6	10.948	18	10 53 1.66	1.8014	1 51 39.2	12.105
19	9 27 12.78	1.8736	10 59 45.6	10.987	19	10 54 49.75	1.8014	1 39 32.6	12.114
20	9 29 5.10	1.8706	10 48 45.2	11.026	20	10 56 37.83	1.8013	1 27 25.5	12.122
21	9 30 57.25	1.8678	10 37 42.5	11.063	21	10 58 25.91	1.8015	1 15 18.0	12.129
22	9 32 49.23	1.8649	10 26 37.6	11.101	22	11 0 14.01	1.8017	1 3 10.0	12.137
23	9 34 41.04	1.8621	10 15 30.4	11.138	23	11 2 2.11	1.8019	0 51 1.6	12.143
24	9 36 32.68	1.8593	+10 4 21.1	-11.178	24	11 3 50.24	1.8023	+ 0 38 52.8	-12.149

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 9.					NOVEMBER 11.				
	^h ^m ^s		[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	11 3 50.24	1.8023	+0 38 52.8	-12.149	0	12 31 54.09	1.8906	- 8 58 27.0	-11.635
1	11 5 38.39	1.8027	0 26 43.7	12.154	1	12 33 47.63	1.8940	9 10 4.3	11.606
2	11 7 26.56	1.8031	0 14 34.3	12.158	2	12 35 41.37	1.8974	9 21 39.7	11.576
3	11 9 14.76	1.8036	+0 2 24.7	12.163	3	12 37 35.32	1.9008	9 33 13.4	11.546
4	11 11 2.99	1.8042	-0 9 45.2	12.166	4	12 39 29.47	1.9043	9 44 45.2	11.514
5	11 12 51.26	1.8048	0 21 55.2	12.168	5	12 41 23.84	1.9079	9 56 15.1	11.482
6	11 14 39.56	1.8054	0 34 5.4	12.171	6	12 43 18.42	1.9114	10 7 43.0	11.448
7	11 16 27.91	1.8063	0 46 15.7	12.172	7	12 45 13.21	1.9150	10 19 8.9	11.415
8	11 18 16.31	1.8071	0 58 26.0	12.173	8	12 47 8.22	1.9188	10 30 32.8	11.380
9	11 20 4.76	1.8079	1 10 36.4	12.173	9	12 49 3.46	1.9225	10 41 54.5	11.343
10	11 21 53.26	1.8088	1 22 46.8	12.173	10	12 50 58.92	1.9263	10 53 14.0	11.307
11	11 23 41.82	1.8099	1 34 57.1	12.171	11	12 52 54.62	1.9302	11 4 31.3	11.269
12	11 25 30.45	1.8110	1 47 7.3	12.169	12	12 54 50.54	1.9340	11 15 46.3	11.231
13	11 27 19.14	1.8121	1 59 17.4	12.167	13	12 56 46.70	1.9380	11 26 59.0	11.192
14	11 29 7.90	1.8133	2 11 27.3	12.163	14	12 58 43.10	1.9420	11 38 9.3	11.151
15	11 30 56.74	1.8146	2 23 37.0	12.160	15	13 0 39.74	1.9460	11 49 17.1	11.109
16	11 32 45.65	1.8159	2 35 46.5	12.155	16	13 2 36.62	1.9502	12 0 22.4	11.067
17	11 34 34.65	1.8173	2 47 55.6	12.150	17	13 4 33.76	1.9543	12 11 25.1	11.024
18	11 36 23.73	1.8187	3 0 4.5	12.145	18	13 6 31.14	1.9585	12 22 25.3	10.981
19	11 38 12.89	1.8202	3 12 13.0	12.138	19	13 8 28.78	1.9628	12 33 22.8	10.935
20	11 40 2.15	1.8218	3 24 21.0	12.131	20	13 10 26.67	1.9670	12 44 17.5	10.889
21	11 41 51.51	1.8235	3 36 28.7	12.123	21	13 12 24.82	1.9714	12 55 9.5	10.843
22	11 43 40.97	1.8252	3 48 35.8	12.114	22	13 14 23.24	1.9758	13 5 58.6	10.794
23	11 45 30.53	1.8269	-4 0 42.4	-12.105	23	13 16 21.92	1.9802	-13 16 44.8	-10.745
NOVEMBER 10.					NOVEMBER 12.				
	^h ^m ^s		[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	11 47 20.20	1.8288	-4 12 48.4	-12.095	0	13 18 20.86	1.9846	-13 27 28.0	-10.695
1	11 49 9.98	1.8307	4 24 53.8	12.085	1	13 20 20.07	1.9892	13 38 8.2	10.644
2	11 50 59.88	1.8326	4 36 58.6	12.073	2	13 22 19.56	1.9938	13 48 45.3	10.593
3	11 52 49.89	1.8346	4 49 2.6	12.061	3	13 24 19.32	1.9983	13 59 19.3	10.540
4	11 54 40.03	1.8368	5 1 5.9	12.048	4	13 26 19.36	2.0029	14 9 50.1	10.486
5	11 56 30.30	1.8388	5 13 8.4	12.035	5	13 28 19.67	2.0076	14 20 17.6	10.431
6	11 58 20.69	1.8410	5 25 10.1	12.021	6	13 30 20.27	2.0124	14 30 41.8	10.375
7	12 0 11.22	1.8433	5 37 10.9	12.006	7	13 32 21.16	2.0172	14 41 2.6	10.318
8	12 2 1.88	1.8456	5 49 10.8	11.990	8	13 34 22.33	2.0219	14 51 20.0	10.260
9	12 3 52.69	1.8479	6 1 9.7	11.973	9	13 36 23.79	2.0267	15 1 33.8	10.201
10	12 5 43.63	1.8503	6 13 7.6	11.957	10	13 38 25.53	2.0315	15 11 44.1	10.141
11	12 7 34.73	1.8529	6 25 4.5	11.938	11	13 40 27.57	2.0365	15 21 50.7	10.080
12	12 9 25.98	1.8555	6 37 0.2	11.919	12	13 42 29.91	2.0414	15 31 53.7	10.018
13	12 11 17.39	1.8581	6 48 54.8	11.901	13	13 44 32.54	2.0464	15 41 52.9	9.955
14	12 13 8.95	1.8607	7 0 48.3	11.881	14	13 46 35.48	2.0514	15 51 48.3	9.891
15	12 15 0.67	1.8635	7 12 40.5	11.859	15	13 48 38.71	2.0564	16 1 39.8	9.825
16	12 16 52.57	1.8663	7 24 31.4	11.838	16	13 50 42.25	2.0615	16 11 27.3	9.758
17	12 18 44.63	1.8691	7 36 21.0	11.816	17	13 52 46.09	2.0665	16 21 10.8	9.692
18	12 20 36.86	1.8720	7 48 9.3	11.793	18	13 54 50.23	2.0717	16 30 50.3	9.623
19	12 22 29.27	1.8750	7 59 56.1	11.768	19	13 56 54.69	2.0768	16 40 25.6	9.553
20	12 24 21.86	1.8780	8 11 41.4	11.743	20	13 58 59.45	2.0819	16 49 56.7	9.483
21	12 26 14.63	1.8811	8 23 25.2	11.717	21	14 1 4.52	2.0871	16 59 23.5	9.411
22	12 28 7.59	1.8843	8 35 7.4	11.691	22	14 3 9.90	2.0923	17 8 46.0	9.338
23	12 30 0.74	1.8875	8 46 48.1	11.663	23	14 5 15.60	2.0976	17 18 4.1	9.264
24	12 31 54.09	1.8908	-8 58 27.0	-11.635	24	14 7 21.61	2.1028	-17 27 17.7	-9.189

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 13.					NOVEMBER 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 7 21.61	2.1028	-17 27 17.7	-9.189	0	15 54 20.73	2.3470	-23 0 46.1	-4.290
1	14 9 27.94	2.1081	17 36 26.8	9.113	1	15 56 41.68	2.3512	23 4 59.7	4.163
2	14 11 34.58	2.1133	17 45 31.2	9.035	2	15 59 2.87	2.3553	23 9 5.7	4.035
3	14 13 41.54	2.1187	17 54 31.0	8.958	3	16 1 24.32	2.3594	23 13 3.9	3.906
4	14 15 48.82	2.1240	18 3 26.1	8.878	4	16 3 46.00	2.3634	23 16 54.4	3.777
5	14 17 56.42	2.1293	18 12 16.3	8.797	5	16 6 7.93	2.3674	23 20 37.1	3.646
6	14 20 4.34	2.1347	18 21 1.7	8.715	6	16 8 30.09	2.3712	23 24 11.9	3.513
7	14 22 12.58	2.1400	18 29 42.1	8.633	7	16 10 52.47	2.3749	23 27 38.7	3.382
8	14 24 21.14	2.1453	18 38 17.6	8.548	8	16 13 15.06	2.3788	23 30 57.7	3.249
9	14 26 30.02	2.1507	18 46 47.9	8.463	9	16 15 37.92	2.3823	23 34 8.6	3.114
10	14 28 39.22	2.1560	18 55 13.1	8.378	10	16 18 0.96	2.3858	23 37 11.4	2.980
11	14 30 48.74	2.1614	19 3 33.2	8.290	11	16 20 24.22	2.3893	23 40 6.2	2.845
12	14 32 58.59	2.1668	19 11 47.9	8.201	12	16 22 47.68	2.3928	23 42 52.8	2.709
13	14 35 8.76	2.1722	19 19 57.3	8.112	13	16 25 11.35	2.3961	23 45 31.3	2.573
14	14 37 19.25	2.1775	19 28 1.3	8.022	14	16 27 35.21	2.3993	23 48 1.5	2.434
15	14 39 30.06	2.1829	19 35 59.9	7.929	15	16 29 59.26	2.4023	23 50 23.4	2.297
16	14 41 41.20	2.1883	19 43 52.8	7.836	16	16 32 23.49	2.4054	23 52 37.1	2.158
17	14 43 52.65	2.1936	19 51 40.2	7.743	17	16 34 47.91	2.4084	23 54 42.4	2.019
18	14 46 4.43	2.1990	19 59 21.9	7.647	18	16 37 12.50	2.4113	23 56 39.4	1.879
19	14 48 16.53	2.2043	20 6 57.8	7.550	19	16 39 37.27	2.4141	23 58 27.9	1.738
20	14 50 28.95	2.2096	20 14 27.9	7.453	20	16 42 2.19	2.4168	24 0 8.0	1.598
21	14 52 41.68	2.2149	20 21 52.2	7.355	21	16 44 27.28	2.4194	24 1 39.6	1.456
22	14 54 54.74	2.2203	20 29 10.5	7.254	22	16 46 52.52	2.4218	24 3 2.7	1.314
23	14 57 8.11	2.2256	-20 36 22.7	-7.153	23	16 49 17.90	2.4243	-24 4 17.3	-1.172
NOVEMBER 14.					NOVEMBER 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 59 21.80	2.2308	-20 43 28.9	-7.062	0	16 51 43.43	2.4266	-24 5 23.3	-1.028
1	15 1 35.81	2.2360	20 50 28.9	6.949	1	16 54 9.09	2.4288	24 6 20.7	0.885
2	15 3 50.12	2.2413	20 57 22.8	6.845	2	16 56 34.88	2.4309	24 7 9.5	0.742
3	15 6 4.76	2.2465	21 4 10.3	6.739	3	16 59 0.80	2.4330	24 7 49.7	0.597
4	15 8 19.70	2.2516	21 10 51.5	6.633	4	17 1 26.84	2.4348	24 8 21.1	0.452
5	15 10 34.95	2.2568	21 17 26.3	6.527	5	17 3 52.98	2.4367	24 8 43.9	0.308
6	15 12 50.51	2.2619	21 23 54.7	6.418	6	17 6 19.24	2.4384	24 8 58.0	0.163
7	15 15 6.38	2.2670	21 30 16.4	6.308	7	17 8 45.59	2.4400	24 9 3.4	-0.017
8	15 17 22.55	2.2721	21 36 31.6	6.198	8	17 11 12.04	2.4415	24 9 0.0	+0.130
9	15 19 39.03	2.2772	21 42 40.2	6.087	9	17 13 38.57	2.4429	24 8 47.8	0.276
10	15 21 55.81	2.2821	21 48 42.0	5.973	10	17 16 5.19	2.4443	24 8 26.9	0.422
11	15 24 12.88	2.2870	21 54 36.9	5.859	11	17 18 31.88	2.4454	24 7 57.2	0.568
12	15 26 30.25	2.2919	22 0 25.1	5.745	12	17 20 58.64	2.4466	24 7 18.7	0.715
13	15 28 47.91	2.2968	22 6 6.3	5.629	13	17 23 25.47	2.4476	24 6 31.4	0.862
14	15 31 5.87	2.3017	22 11 40.6	5.513	14	17 25 52.35	2.4484	24 5 35.3	1.009
15	15 33 24.11	2.3064	22 17 7.8	5.394	15	17 28 19.28	2.4493	24 4 30.3	1.157
16	15 35 42.64	2.3112	22 22 27.9	5.275	16	17 30 46.26	2.4500	24 3 16.5	1.303
17	15 38 1.45	2.3158	22 27 40.8	5.155	17	17 33 13.28	2.4506	24 1 53.9	1.451
18	15 40 20.54	2.3204	22 32 46.5	5.035	18	17 35 40.33	2.4511	24 0 22.4	1.598
19	15 42 39.90	2.3249	22 37 45.0	4.913	19	17 38 7.41	2.4515	23 58 42.1	1.745
20	15 44 59.53	2.3295	22 42 36.1	4.790	20	17 40 34.51	2.4518	23 56 53.0	1.893
21	15 47 19.44	2.3340	22 47 19.8	4.667	21	17 43 1.62	2.4519	23 54 55.0	2.040
22	15 49 39.61	2.3383	22 51 56.1	4.543	22	17 45 28.74	2.4521	23 52 48.2	2.188
23	15 52 0.04	2.3427	22 56 24.9	4.417	23	17 47 55.87	2.4521	23 50 32.5	2.335
24	15 54 20.73	2.3470	-23 0 46.1	-4.290	24	17 50 22.99	2.4519	-23 48 8.0	+2.482

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 17.					NOVEMBER 19.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	17 50 22.90	2.4519	-23 48 8.0	+2.482	0	19 46 20.47	2.3543	-19 7 15.0	+8.972
1	17 52 50.10	2.4518	23 45 34.7	2.628	1	19 48 41.63	2.3511	18 58 13.2	9.088
2	17 55 17.20	2.4515	23 42 52.6	2.775	2	19 51 2.60	2.3478	18 49 4.5	9.202
3	17 57 44.28	2.4510	23 40 1.7	2.922	3	19 53 23.36	2.3444	18 39 49.0	9.315
4	18 0 11.32	2.4505	23 37 2.0	3.068	4	19 55 43.93	2.3412	18 30 26.7	9.428
5	18 2 38.34	2.4500	23 33 53.5	3.214	5	19 58 4.30	2.3378	18 20 57.7	9.539
6	18 5 5.32	2.4493	23 30 36.3	3.359	6	20 0 24.46	2.3344	18 11 22.0	9.650
7	18 7 32.25	2.4485	23 27 10.4	3.505	7	20 2 44.43	2.3311	18 1 39.7	9.759
8	18 9 59.14	2.4477	23 23 35.7	3.651	8	20 5 4.19	2.3277	17 51 50.9	9.867
9	18 12 25.97	2.4467	23 19 52.3	3.796	9	20 7 23.75	2.3243	17 41 55.7	9.974
10	18 14 52.74	2.4456	23 16 0.2	3.940	10	20 9 43.11	2.3210	17 31 54.0	10.081
11	18 17 19.44	2.4444	23 11 59.5	4.084	11	20 12 2.27	2.3176	17 21 46.0	10.185
12	18 19 46.07	2.4433	23 7 50.1	4.228	12	20 14 21.22	2.3142	17 11 31.8	10.288
13	18 22 12.63	2.4419	23 3 32.1	4.372	13	20 16 39.97	2.3108	17 1 11.4	10.392
14	18 24 39.10	2.4405	22 59 5.5	4.515	14	20 18 58.52	2.3074	16 50 44.8	10.493
15	18 27 5.49	2.4391	22 54 30.3	4.658	15	20 21 16.86	2.3041	16 40 12.2	10.593
16	18 29 31.79	2.4375	22 49 46.6	4.799	16	20 23 35.01	2.3008	16 29 33.7	10.692
17	18 31 57.99	2.4358	22 44 54.4	4.941	17	20 25 52.95	2.2973	16 18 49.2	10.790
18	18 34 24.09	2.4341	22 39 53.7	5.082	18	20 28 10.69	2.2941	16 7 58.9	10.887
19	18 36 50.08	2.4323	22 34 44.6	5.222	19	20 30 28.24	2.2908	15 57 2.8	10.983
20	18 39 15.96	2.4304	22 29 27.1	5.363	20	20 32 45.58	2.2874	15 46 0.9	11.078
21	18 41 41.73	2.4285	22 24 1.1	5.502	21	20 35 2.73	2.2841	15 34 53.5	11.170
22	18 44 7.38	2.4264	22 18 26.9	5.639	22	20 37 19.67	2.2808	15 23 40.5	11.263
23	18 46 32.90	2.4243	-22 12 44.4	+5.778	23	20 39 36.43	2.2776	-15 12 22.0	+11.353
NOVEMBER 18.					NOVEMBER 20.				
0	18 48 58.80	2.4222	-22 6 53.6	+5.915	0	20 41 52.98	2.2743	-15 0 58.1	+11.443
1	18 51 23.56	2.4199	22 0 54.6	6.052	1	20 44 9.34	2.2712	14 49 28.9	11.531
2	18 53 48.69	2.4177	21 54 47.4	6.188	2	20 46 25.52	2.2680	14 37 54.4	11.618
3	18 56 13.68	2.4153	21 48 32.1	6.323	3	20 48 41.50	2.2648	14 26 14.7	11.705
4	18 58 38.53	2.4129	21 42 8.6	6.458	4	20 50 57.29	2.2617	14 14 29.8	11.789
5	19 1 3.23	2.4103	21 35 37.1	6.591	5	20 53 12.90	2.2586	14 2 40.0	11.873
6	19 3 27.77	2.4078	21 28 57.7	6.724	6	20 55 28.32	2.2555	13 50 45.1	11.955
7	19 5 52.16	2.4053	21 22 10.2	6.858	7	20 57 43.56	2.2524	13 38 45.4	12.036
8	19 8 16.40	2.4026	21 15 14.8	6.988	8	20 59 58.61	2.2494	13 26 40.8	12.116
9	19 10 40.47	2.3998	21 8 11.6	7.119	9	21 2 13.49	2.2464	13 14 31.5	12.194
10	19 13 4.38	2.3972	21 1 0.5	7.249	10	21 4 28.18	2.2434	13 2 17.5	12.273
11	19 15 28.13	2.3943	20 53 41.7	7.378	11	21 6 42.70	2.2406	12 49 58.8	12.348
12	19 17 51.70	2.3914	20 46 15.2	7.506	12	21 8 57.05	2.2378	12 37 35.7	12.423
13	19 20 15.10	2.3886	20 38 41.0	7.633	13	21 11 11.23	2.2348	12 25 8.1	12.496
14	19 22 38.33	2.3857	20 30 59.2	7.759	14	21 13 25.23	2.2321	12 12 36.2	12.568
15	19 25 1.38	2.3826	20 23 9.9	7.885	15	21 15 39.08	2.2293	11 59 59.9	12.640
16	19 27 24.24	2.3796	20 15 13.0	8.010	16	21 17 52.75	2.2266	11 47 19.4	12.709
17	19 29 46.93	2.3766	20 7 8.7	8.133	17	21 20 6.27	2.2239	11 34 34.8	12.778
18	19 32 9.43	2.3735	19 58 57.0	8.256	18	21 22 19.62	2.2213	11 21 46.0	12.846
19	19 34 31.75	2.3703	19 50 38.0	8.378	19	21 24 32.83	2.2188	11 8 53.3	12.911
20	19 36 53.87	2.3672	19 42 11.7	8.498	20	21 26 45.87	2.2162	10 55 56.7	12.976
21	19 39 15.81	2.3641	19 33 38.2	8.618	21	21 28 58.77	2.2138	10 42 56.2	13.040
22	19 41 37.56	2.3608	19 24 57.6	8.737	22	21 31 11.52	2.2113	10 29 51.9	13.103
23	19 43 59.11	2.3576	19 16 9.8	8.855	23	21 33 24.13	2.2089	10 16 43.9	13.163
24	19 46 20.47	2.3543	-19 7 15.0	+8.972	24	21 35 36.59	2.2066	-10 3 32.3	+13.223

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 21.					NOVEMBER 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 35 36.59	2.2066	-10 3 32.3	+13.223	0	23 19 57.57	2.1663	+ 1 15 13.6	+14.551
1	21 37 48.92	2.2043	9 50 17.2	13.231	1	23 22 7.57	2.1670	1 29 46.5	14.546
2	21 40 1.11	2.2020	9 36 58.6	13.338	2	23 24 17.61	2.1678	1 44 19.1	14.540
3	21 42 13.16	2.1998	9 23 36.6	13.394	3	23 26 27.71	2.1688	1 58 51.3	14.532
4	21 44 25.09	2.1978	9 10 11.3	13.449	4	23 28 37.87	2.1698	2 13 22.9	14.523
5	21 46 36.89	2.1957	8 56 42.7	13.503	5	23 30 48.08	2.1708	2 27 54.0	14.513
6	21 48 48.57	2.1938	8 43 11.0	13.554	6	23 32 58.37	2.1720	2 42 24.4	14.499
7	21 51 0.14	2.1918	8 29 36.2	13.605	7	23 35 8.72	2.1732	2 56 53.9	14.486
8	21 53 11.58	2.1898	8 15 58.4	13.654	8	23 37 19.15	2.1744	3 11 22.7	14.472
9	21 55 22.91	2.1880	8 2 17.7	13.702	9	23 39 29.65	2.1757	3 25 50.5	14.455
10	21 57 34.14	2.1862	7 48 34.2	13.749	10	23 41 40.23	2.1771	3 40 17.3	14.438
11	21 59 45.25	2.1844	7 34 47.8	13.795	11	23 43 50.90	2.1786	3 54 43.1	14.419
12	22 1 56.27	2.1828	7 20 58.8	13.838	12	23 46 1.66	2.1801	4 9 7.6	14.398
13	22 4 7.19	2.1812	7 7 7.2	13.882	13	23 48 12.51	2.1817	4 23 30.9	14.377
14	22 6 18.01	2.1797	6 53 13.0	13.923	14	23 50 23.46	2.1833	4 37 52.8	14.353
15	22 8 28.75	2.1782	6 39 16.4	13.963	15	23 52 34.51	2.1851	4 52 13.2	14.328
16	22 10 39.39	2.1767	6 25 17.4	14.003	16	23 54 45.67	2.1868	5 6 32.2	14.303
17	22 12 49.95	2.1754	6 11 16.1	14.040	17	23 56 56.93	2.1887	5 20 49.6	14.275
18	22 15 0.44	2.1741	5 57 12.6	14.077	18	23 59 8.31	2.1906	5 35 5.2	14.246
19	22 17 10.84	2.1728	5 43 6.9	14.112	19	0 1 19.80	2.1925	5 49 19.1	14.216
20	22 19 21.18	2.1716	5 28 59.2	14.146	20	0 3 31.41	2.1945	6 3 31.1	14.184
21	22 21 31.45	2.1706	5 14 49.4	14.178	21	0 5 43.14	2.1966	6 17 41.2	14.151
22	22 23 41.65	2.1695	5 0 37.8	14.209	22	0 7 55.00	2.1988	6 31 49.2	14.117
23	22 25 51.79	2.1686	- 4 46 24.3	+14.239	23	0 10 6.99	2.2009	+ 6 45 55.2	+14.081
NOVEMBER 22.					NOVEMBER 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 28 1.88	2.1678	- 4 32 9.1	+14.268	0	0 12 19.11	2.2032	+ 6 59 58.9	+14.043
1	22 30 11.92	2.1668	4 17 52.2	14.294	1	0 14 31.37	2.2054	7 14 0.3	14.004
2	22 32 21.90	2.1661	4 3 33.8	14.320	2	0 16 43.76	2.2078	7 27 59.4	13.964
3	22 34 31.85	2.1654	3 49 13.8	14.345	3	0 18 56.31	2.2108	7 41 56.0	13.923
4	22 36 41.75	2.1648	3 34 52.4	14.368	4	0 21 8.99	2.2127	7 55 50.1	13.879
5	22 38 51.62	2.1642	3 20 29.6	14.390	5	0 23 21.83	2.2153	8 9 41.5	13.834
6	22 41 1.45	2.1637	3 6 5.6	14.410	6	0 25 34.82	2.2178	8 23 30.2	13.788
7	22 43 11.26	2.1633	2 51 40.4	14.430	7	0 27 47.97	2.2205	8 37 16.1	13.741
8	22 45 21.04	2.1628	2 37 14.0	14.448	8	0 30 1.28	2.2232	8 50 59.1	13.692
9	22 47 30.80	2.1625	2 22 46.7	14.464	9	0 32 14.75	2.2258	9 4 39.1	13.642
10	22 49 40.54	2.1623	2 8 18.3	14.480	10	0 34 28.38	2.2286	9 18 16.1	13.589
11	22 51 50.28	2.1622	1 53 49.1	14.493	11	0 36 42.18	2.2314	9 31 49.8	13.536
12	22 54 0.00	2.1620	1 39 19.1	14.506	12	0 38 56.15	2.2343	9 45 20.4	13.482
13	22 56 9.72	2.1620	1 24 48.4	14.518	13	0 41 10.29	2.2373	9 58 47.6	13.425
14	22 58 19.44	2.1621	1 10 17.0	14.528	14	0 43 24.62	2.2403	10 12 11.4	13.368
15	23 0 29.17	2.1622	0 55 45.1	14.536	15	0 45 39.12	2.2432	10 25 31.8	13.309
16	23 2 38.90	2.1623	0 41 12.7	14.543	16	0 47 53.80	2.2462	10 38 48.5	13.248
17	23 4 48.65	2.1626	0 26 40.0	14.548	17	0 50 8.66	2.2493	10 52 1.5	13.186
18	23 6 58.41	2.1628	- 0 12 6.9	14.554	18	0 52 23.72	2.2525	11 5 10.8	13.123
19	23 9 8.19	2.1633	+ 0 2 26.5	14.557	19	0 54 38.96	2.2556	11 18 16.2	13.058
20	23 11 18.00	2.1638	0 16 59.9	14.558	20	0 56 54.39	2.2588	11 31 17.7	12.992
21	23 13 27.84	2.1643	0 31 33.4	14.559	21	0 59 10.02	2.2621	11 44 15.2	12.924
22	23 15 37.71	2.1648	0 46 7.0	14.558	22	1 1 25.84	2.2653	11 57 8.6	12.854
23	23 17 47.62	2.1655	1 0 40.4	14.555	23	1 3 41.85	2.2686	12 9 57.7	12.787
24	23 19 57.57	2.1663	+ 1 15 13.6	+14.551	24	1 5 58.07	2.2720	+12 22 42.6	+12.7

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 25.					NOVEMBER 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 5 58.07	2.2720	+12 22 42.6	+12.712	0	2 59 3.30	2.4348	+20 43 36.9	+7.670
1	1 8 14.49	2.2755	12 35 23.1	12.638	1	3 1 29.47	2.4374	20 51 13.1	7.537
2	1 10 31.11	2.2788	12 47 59.2	12.563	2	3 3 55.79	2.4400	20 58 41.3	7.402
3	1 12 47.94	2.2822	13 0 30.7	12.487	3	3 6 22.27	2.4426	21 6 1.3	7.266
4	1 15 4.97	2.2856	13 12 57.6	12.409	4	3 8 48.90	2.4450	21 13 13.2	7.130
5	1 17 22.21	2.2891	13 25 19.8	12.330	5	3 11 15.67	2.4473	21 20 16.9	6.993
6	1 19 39.66	2.2925	13 37 37.2	12.249	6	3 13 42.57	2.4496	21 27 12.4	6.855
7	1 21 57.31	2.2960	13 49 49.7	12.167	7	3 16 9.62	2.4518	21 33 59.5	6.716
8	1 24 15.18	2.2996	14 1 57.2	12.083	8	3 18 36.79	2.4539	21 40 38.3	6.577
9	1 26 33.26	2.3032	14 13 59.6	11.998	9	3 21 4.09	2.4560	21 47 8.7	6.437
10	1 28 51.56	2.3068	14 25 57.0	11.913	10	3 23 31.51	2.4579	21 53 30.7	6.295
11	1 31 10.07	2.3103	14 37 49.1	11.824	11	3 25 59.04	2.4598	21 59 44.1	6.153
12	1 33 28.79	2.3138	14 49 35.9	11.735	12	3 28 26.69	2.4618	22 5 49.1	6.012
13	1 35 47.73	2.3175	15 1 17.3	11.645	13	3 30 54.45	2.4634	22 11 45.5	5.868
14	1 38 6.89	2.3211	15 12 53.3	11.553	14	3 33 22.30	2.4651	22 17 33.3	5.724
15	1 40 26.26	2.3247	15 24 23.7	11.459	15	3 35 50.26	2.4667	22 23 12.4	5.580
16	1 42 45.85	2.3283	15 35 48.4	11.365	16	3 38 18.30	2.4680	22 28 42.9	5.436
17	1 45 5.66	2.3320	15 47 7.5	11.269	17	3 40 46.42	2.4694	22 34 4.7	5.291
18	1 47 25.69	2.3356	15 58 20.7	11.171	18	3 43 14.63	2.4708	22 39 17.8	5.144
19	1 49 45.93	2.3392	16 9 28.0	11.073	19	3 45 42.91	2.4718	22 44 22.0	4.998
20	1 52 6.39	2.3428	16 20 29.4	10.973	20	3 48 11.25	2.4729	22 49 17.5	4.852
21	1 54 27.07	2.3464	16 31 24.7	10.871	21	3 50 39.66	2.4739	22 54 4.2	4.704
22	1 56 47.96	2.3500	16 42 13.9	10.768	22	3 53 8.12	2.4748	22 58 42.0	4.557
23	1 59 9.07	2.3536	+16 52 56.9	+10.664	23	3 55 36.63	2.4756	+23 3 11.0	+4.408
NOVEMBER 26.					NOVEMBER 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 1 30.39	2.3572	+17 3 33.6	+10.558	0	3 58 5.19	2.4763	+23 7 31.0	+4.259
1	2 3 51.93	2.3608	17 14 3.9	10.452	1	4 0 33.79	2.4768	23 11 42.1	4.111
2	2 6 13.69	2.3644	17 24 27.8	10.344	2	4 3 2.41	2.4773	23 15 44.3	3.963
3	2 8 35.66	2.3679	17 34 45.2	10.235	3	4 5 31.07	2.4778	23 19 37.6	3.813
4	2 10 57.84	2.3714	17 44 56.0	10.124	4	4 7 59.74	2.4779	23 23 21.9	3.663
5	2 13 20.23	2.3749	17 55 0.1	10.013	5	4 10 28.42	2.4781	23 26 57.2	3.513
6	2 15 42.83	2.3784	18 4 57.5	9.899	6	4 12 57.11	2.4782	23 30 23.5	3.363
7	2 18 5.64	2.3819	18 14 48.0	9.785	7	4 15 25.80	2.4782	23 33 40.8	3.213
8	2 20 28.66	2.3854	18 24 31.7	9.670	8	4 17 54.49	2.4780	23 36 49.1	3.063
9	2 22 51.89	2.3888	18 34 8.4	9.553	9	4 20 23.16	2.4777	23 39 48.3	2.913
10	2 25 15.31	2.3921	18 43 38.0	9.435	10	4 22 51.81	2.4773	23 42 38.6	2.763
11	2 27 38.94	2.3955	18 53 0.6	9.317	11	4 25 20.44	2.4768	23 45 19.8	2.611
12	2 30 2.77	2.3988	19 2 16.0	9.196	12	4 27 49.03	2.4763	23 47 51.9	2.460
13	2 32 26.80	2.4021	19 11 24.1	9.075	13	4 30 17.59	2.4756	23 50 15.0	2.310
14	2 34 51.02	2.4053	19 20 25.0	8.953	14	4 32 46.10	2.4747	23 52 29.1	2.160
15	2 37 15.43	2.4084	19 29 18.4	8.828	15	4 35 14.55	2.4738	23 54 34.2	2.009
16	2 39 40.03	2.4115	19 38 4.4	8.704	16	4 37 42.95	2.4728	23 56 30.2	1.859
17	2 42 4.81	2.4147	19 46 42.9	8.578	17	4 40 11.28	2.4716	23 58 17.3	1.709
18	2 44 29.79	2.4178	19 55 13.8	8.452	18	4 42 39.54	2.4703	23 59 55.3	1.558
19	2 46 54.94	2.4207	20 3 37.1	8.324	19	4 45 7.72	2.4690	24 1 24.3	1.408
20	2 49 20.27	2.4236	20 11 52.7	8.195	20	4 47 35.82	2.4675	24 2 44.3	1.258
21	2 51 45.77	2.4265	20 20 0.5	8.065	21	4 50 3.82	2.4659	24 3 55.3	1.109
22	2 54 11.45	2.4293	20 28 0.5	7.935	22	4 52 31.73	2.4643	24 4 57.4	0.960
23	2 56 37.29	2.4321	20 35 52.7	7.803	23	4 54 59.53	2.4624	24 5 50.5	0.811
24	2 59 3.30	2.4348	+20 43 36.9	+7.670	24	4 57 27.22	2.4605	+24 6 34.7	+0.663

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 29.					DECEMBER 1.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	4 57 27.22	2.4605	+24 6 34.7	+0.663	0	6 51 34.65	2.2661	+21 58 5.6	-5.706
1	4 59 54.79	2.4585	24 7 10.0	0.513	1	6 53 50.45	2.2606	21 52 20.0	5.814
2	5 2 22.24	2.4564	24 7 36.3	0.365	2	6 56 5.92	2.2551	21 46 27.9	5.923
3	5 4 49.56	2.4542	24 7 53.8	0.218	3	6 58 21.06	2.2496	21 40 29.2	6.032
4	5 7 16.74	2.4518	24 8 2.4	+0.071	4	7 0 35.87	2.2440	21 34 24.1	6.138
5	5 9 43.77	2.4493	24 8 2.3	-0.076	5	7 2 50.34	2.2384	21 28 12.6	6.244
6	5 12 10.66	2.4468	24 7 53.3	0.223	6	7 5 4.48	2.2328	21 21 54.8	6.348
7	5 14 37.39	2.4442	24 7 35.5	0.369	7	7 7 18.27	2.2272	21 15 30.8	6.452
8	5 17 3.96	2.4415	24 7 9.0	0.514	8	7 9 31.74	2.2216	21 9 0.6	6.555
9	5 19 30.37	2.4386	24 6 33.8	0.658	9	7 11 44.86	2.2158	21 2 24.2	6.656
10	5 21 56.59	2.4357	24 5 50.0	0.803	10	7 13 57.64	2.2103	20 55 41.9	6.756
11	5 24 22.65	2.4327	24 4 57.4	0.948	11	7 16 10.09	2.2046	20 48 53.5	6.856
12	5 26 48.51	2.4294	24 3 56.3	1.090	12	7 18 22.19	2.1989	20 41 59.2	6.953
13	5 29 14.18	2.4263	24 2 46.6	1.233	13	7 20 33.96	2.1933	20 34 59.1	7.050
14	5 31 39.66	2.4229	24 1 28.3	1.375	14	7 22 45.38	2.1875	20 27 53.2	7.146
15	5 34 4.93	2.4194	24 0 1.6	1.516	15	7 24 56.46	2.1818	20 20 41.6	7.241
16	5 36 29.99	2.4159	23 58 26.4	1.657	16	7 27 7.20	2.1762	20 13 24.3	7.335
17	5 38 54.84	2.4124	23 56 42.8	1.797	17	7 29 17.60	2.1706	20 6 1.4	7.427
18	5 41 19.48	2.4087	23 54 50.8	1.937	18	7 31 27.67	2.1649	19 58 33.1	7.518
19	5 43 43.88	2.4048	23 52 50.4	2.075	19	7 33 37.39	2.1592	19 50 59.2	7.609
20	5 46 8.06	2.4011	23 50 41.8	2.212	20	7 35 46.77	2.1535	19 43 20.0	7.698
21	5 48 32.01	2.3971	23 48 25.0	2.349	21	7 37 55.81	2.1478	19 35 35.4	7.787
22	5 50 55.71	2.3931	23 45 59.9	2.486	22	7 40 4.51	2.1423	19 27 45.6	7.873
23	5 53 19.18	2.3890	+23 43 26.7	-2.621	23	7 42 12.88	2.1367	+19 19 50.6	-7.959
NOVEMBER 30.					DECEMBER 2.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	5 55 42.39	2.3848	+23 40 45.4	-2.756	0	7 44 20.91	2.1310	+19 11 50.5	-8.044
1	5 58 5.35	2.3805	23 37 56.0	2.890	1	7 46 28.60	2.1254	19 3 45.3	8.128
2	6 0 28.05	2.3762	23 34 58.6	3.023	2	7 48 35.96	2.1198	18 55 35.2	8.211
3	6 2 50.49	2.3718	23 31 53.3	3.154	3	7 50 42.98	2.1143	18 47 20.0	8.293
4	6 5 12.66	2.3673	23 28 40.1	3.286	4	7 52 49.67	2.1088	18 39 0.1	8.373
5	6 7 34.56	2.3628	23 25 19.0	3.416	5	7 54 56.03	2.1033	18 30 35.3	8.453
6	6 9 56.19	2.3582	23 21 50.2	3.545	6	7 57 2.06	2.0978	18 22 5.7	8.532
7	6 12 17.54	2.3535	23 18 13.6	3.673	7	7 59 7.76	2.0923	18 13 31.5	8.608
8	6 14 38.61	2.3488	23 14 29.4	3.801	8	8 1 13.13	2.0868	18 4 52.7	8.685
9	6 16 59.40	2.3440	23 10 37.5	3.928	9	8 3 18.17	2.0813	17 56 9.3	8.761
10	6 19 19.89	2.3391	23 6 38.1	4.053	10	8 5 22.89	2.0760	17 47 21.4	8.836
11	6 21 40.09	2.3342	23 2 31.2	4.178	11	8 7 27.29	2.0706	17 38 29.0	8.909
12	6 23 59.99	2.3292	22 58 16.8	4.301	12	8 9 31.36	2.0653	17 29 32.3	8.981
13	6 26 19.59	2.3242	22 53 55.1	4.423	13	8 11 35.12	2.0599	17 20 31.3	9.053
14	6 28 38.89	2.3192	22 49 26.0	4.546	14	8 13 38.55	2.0547	17 11 26.0	9.123
15	6 30 57.89	2.3141	22 44 49.6	4.666	15	8 15 41.68	2.0495	17 2 16.6	9.192
16	6 33 16.58	2.3088	22 40 6.1	4.785	16	8 17 44.49	2.0443	16 53 3.0	9.260
17	6 35 34.95	2.3036	22 35 15.4	4.904	17	8 19 46.99	2.0391	16 43 45.4	9.328
18	6 37 53.01	2.2983	22 30 17.6	5.022	18	8 21 49.18	2.0339	16 34 23.7	9.394
19	6 40 10.75	2.2931	22 25 12.8	5.138	19	8 23 51.06	2.0288	16 24 58.1	9.458
20	6 42 28.18	2.2878	22 20 1.0	5.253	20	8 25 52.64	2.0238	16 15 28.7	9.523
21	6 44 45.28	2.2824	22 14 42.4	5.368	21	8 27 53.92	2.0188	16 5 55.3	9.587
22	6 47 2.07	2.2770	22 9 16.9	5.482	22	8 29 54.90	2.0138	15 56 18.2	9.648
23	6 49 18.52	2.2715	22 3 44.6	5.594	23	8 31 55.58	2.0088	15 46 37.5	9.710
24	6 51 34.65	2.2661	+21 58 5.6	-5.706	24	8 33 55.96	2.0039	+15 36 53.0	-9.771

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 3.					DECEMBER 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 33 55.96	2.0039	+15 36 53.0	-9.771	0	10 5 28.11	1.8323	+6 54 33.7	-11.692
1	8 35 56.05	1.9992	15 27 5.0	9.830	1	10 7 17.98	1.8302	6 42 51.5	11.714
2	8 37 55.86	1.9943	15 17 13.4	9.889	2	10 9 7.73	1.8281	6 31 8.0	11.735
3	8 39 55.37	1.9896	15 7 18.3	9.948	3	10 10 57.35	1.8262	6 19 23.3	11.756
4	8 41 54.61	1.9849	14 57 19.7	10.004	4	10 12 46.87	1.8243	6 7 37.3	11.777
5	8 43 53.56	1.9802	14 47 17.8	10.059	5	10 14 36.27	1.8224	5 55 50.1	11.796
6	8 45 52.23	1.9756	14 37 12.6	10.114	6	10 16 25.56	1.8206	5 44 1.8	11.814
7	8 47 50.63	1.9710	14 27 4.1	10.168	7	10 18 14.74	1.8189	5 32 12.4	11.833
8	8 49 48.75	1.9664	14 16 52.4	10.222	8	10 20 3.83	1.8173	5 20 21.9	11.851
9	8 51 46.60	1.9620	14 6 37.5	10.274	9	10 21 52.82	1.8158	5 8 30.3	11.868
10	8 53 44.19	1.9577	13 56 19.5	10.325	10	10 23 41.72	1.8143	4 56 37.8	11.883
11	8 55 41.52	1.9533	13 45 58.5	10.376	11	10 25 30.53	1.8128	4 44 44.3	11.899
12	8 57 38.58	1.9489	13 35 34.4	10.426	12	10 27 19.26	1.8115	4 32 49.9	11.914
13	8 59 35.39	1.9447	13 25 7.4	10.474	13	10 29 7.91	1.8102	4 20 54.6	11.929
14	9 1 31.94	1.9404	13 14 37.5	10.523	14	10 30 56.48	1.8089	4 8 58.4	11.943
15	9 3 28.24	1.9363	13 4 4.7	10.570	15	10 32 44.98	1.8078	3 57 1.5	11.956
16	9 5 24.29	1.9322	12 53 29.1	10.616	16	10 34 33.42	1.8067	3 45 3.7	11.969
17	9 7 20.10	1.9282	12 42 50.8	10.661	17	10 36 21.78	1.8056	3 33 5.2	11.981
18	9 9 15.67	1.9242	12 32 9.8	10.706	18	10 38 10.09	1.8048	3 21 6.0	11.993
19	9 11 11.00	1.9203	12 21 26.1	10.750	19	10 39 58.35	1.8038	3 9 6.1	12.003
20	9 13 6.10	1.9163	12 10 39.8	10.793	20	10 41 46.55	1.8029	2 57 5.6	12.013
21	9 15 0.96	1.9125	11 59 51.0	10.835	21	10 43 34.70	1.8022	2 45 4.5	12.023
22	9 16 55.60	1.9088	11 48 59.6	10.877	22	10 45 22.81	1.8015	2 33 2.8	12.033
23	9 18 50.02	1.9051	+11 38 5.8	-10.917	23	10 47 10.88	1.8009	+2 21 0.6	-12.041
DECEMBER 4.					DECEMBER 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 20 44.21	1.9014	+11 27 9.6	-10.957	0	10 48 58.92	1.8004	+2 8 57.9	-12.048
1	9 22 38.19	1.8978	11 16 11.0	10.995	1	10 50 46.93	1.7998	1 56 54.8	12.056
2	9 24 31.95	1.8943	11 5 10.2	11.033	2	10 52 34.90	1.7994	1 44 51.2	12.063
3	9 26 25.50	1.8908	10 54 7.0	11.072	3	10 54 22.86	1.7991	1 32 47.3	12.068
4	9 28 18.85	1.8874	10 43 1.6	11.108	4	10 56 10.79	1.7988	1 20 43.0	12.074
5	9 30 11.99	1.8841	10 31 54.1	11.143	5	10 57 58.71	1.7986	1 8 38.4	12.079
6	9 32 4.94	1.8808	10 20 44.4	11.179	6	10 59 46.62	1.7984	0 56 33.5	12.083
7	9 33 57.69	1.8776	10 9 32.6	11.214	7	11 1 34.52	1.7983	0 44 28.4	12.088
8	9 35 50.25	1.8744	9 58 18.7	11.248	8	11 3 22.41	1.7983	0 32 23.0	12.091
9	9 37 42.62	1.8713	9 47 2.9	11.280	9	11 5 10.31	1.7983	0 20 17.5	12.093
10	9 39 34.80	1.8682	9 35 45.1	11.313	10	11 6 58.21	1.7984	+0 8 11.9	12.095
11	9 41 26.80	1.8653	9 24 25.4	11.344	11	11 8 46.12	1.7987	-0 3 53.9	12.097
12	9 43 18.63	1.8623	9 13 3.8	11.375	12	11 10 34.05	1.7989	0 15 59.7	12.098
13	9 45 10.28	1.8595	9 1 40.4	11.405	13	11 12 21.99	1.7992	0 28 5.6	12.098
14	9 47 1.77	1.8568	8 50 15.2	11.435	14	11 14 9.95	1.7996	0 40 11.4	12.097
15	9 48 53.09	1.8539	8 38 48.2	11.464	15	11 15 57.94	1.8001	0 52 17.2	12.097
16	9 50 44.24	1.8513	8 27 19.5	11.492	16	11 17 45.96	1.8006	1 4 23.0	12.095
17	9 52 35.24	1.8487	8 15 49.2	11.519	17	11 19 34.01	1.8011	1 16 28.6	12.093
18	9 54 26.08	1.8462	8 4 17.2	11.546	18	11 21 22.09	1.8018	1 28 34.1	12.090
19	9 56 16.78	1.8437	7 52 43.7	11.572	19	11 23 10.22	1.8025	1 40 39.4	12.087
20	9 58 7.32	1.8412	7 41 8.6	11.598	20	11 24 58.39	1.8033	1 52 44.5	12.083
21	9 59 57.72	1.8389	7 29 32.0	11.622	21	11 26 46.62	1.8042	2 4 49.3	12.078
22	10 1 47.99	1.8366	7 17 54.0	11.646	22	11 28 34.89	1.8051	2 16 53.9	12.073
23	10 3 38.11	1.8343	7 6 14.5	11.669	23	11 30 23.23	1.8061	2 28 58.1	12.067
24	10 5 28.11	1.8323	+ 6 54 33.7	-11.692	24	11 32 11.62	1.8071	-2 41 1.9	-12.060

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 7.					DECEMBER 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 32 11.62	1.8071	- 2 41 1.9	-12.060	0	13 1 25.48	1.9356	-12 0 10.4	-10.963
1	11 34 0.08	1.8083	2 53 5.3	12.053	1	13 3 21.74	1.9398	12 11 6.9	10.921
2	11 35 48.61	1.8095	3 5 8.3	12.046	2	13 5 18.26	1.9441	12 22 0.9	10.879
3	11 37 37.22	1.8108	3 17 10.8	12.038	3	13 7 15.03	1.9483	12 32 52.4	10.836
4	11 39 25.90	1.8121	3 29 12.8	12.029	4	13 9 12.06	1.9528	12 43 41.2	10.791
5	11 41 14.67	1.8135	3 41 14.3	12.020	5	13 11 9.36	1.9573	12 54 27.3	10.746
6	11 43 3.52	1.8149	3 53 15.2	12.009	6	13 13 6.93	1.9618	13 5 10.7	10.700
7	11 44 52.46	1.8164	4 5 15.4	11.998	7	13 15 4.77	1.9663	13 15 51.3	10.653
8	11 46 41.49	1.8181	4 17 15.0	11.988	8	13 17 2.88	1.9708	13 26 29.1	10.605
9	11 48 30.63	1.8198	4 29 13.9	11.976	9	13 19 1.27	1.9755	13 37 3.9	10.556
10	11 50 19.86	1.8215	4 41 12.1	11.963	10	13 20 59.94	1.9802	13 47 35.8	10.507
11	11 52 9.21	1.8233	4 53 9.4	11.949	11	13 22 58.89	1.9849	13 58 4.7	10.456
12	11 53 58.66	1.8252	5 5 6.0	11.936	12	13 24 58.13	1.9898	14 8 30.5	10.404
13	11 55 48.23	1.8271	5 17 1.7	11.921	13	13 26 57.66	1.9946	14 18 53.2	10.352
14	11 57 37.91	1.8291	5 28 56.5	11.906	14	13 28 57.48	1.9995	14 29 12.7	10.298
15	11 59 27.72	1.8312	5 40 50.4	11.890	15	13 30 57.60	2.0044	14 39 29.0	10.243
16	12 1 17.65	1.8333	5 52 43.3	11.873	16	13 32 58.01	2.0094	14 49 41.9	10.188
17	12 3 7.71	1.8355	6 4 35.2	11.857	17	13 34 58.73	2.0144	14 59 51.5	10.132
18	12 4 57.91	1.8378	6 16 26.1	11.839	18	13 36 59.74	2.0195	15 9 57.7	10.074
19	12 6 48.24	1.8401	6 28 15.9	11.820	19	13 39 1.07	2.0248	15 20 0.4	10.015
20	12 8 38.72	1.8425	6 40 4.5	11.801	20	13 41 2.71	2.0298	15 29 59.5	9.956
21	12 10 29.34	1.8450	6 51 52.0	11.781	21	13 43 4.65	2.0350	15 39 55.1	9.896
22	12 12 20.12	1.8475	7 3 38.2	11.760	22	13 45 6.91	2.0403	15 49 47.0	9.833
23	12 14 11.04	1.8501	- 7 15 23.2	-11.739	23	13 47 9.49	2.0457	-15 59 35.1	-9.771
DECEMBER 8.					DECEMBER 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 16 2.13	1.8528	- 7 27 6.9	-11.718	0	13 49 12.39	2.0509	-16 9 19.5	-9.708
1	12 17 53.38	1.8555	7 38 49.3	11.694	1	13 51 15.61	2.0563	16 19 0.0	9.643
2	12 19 44.79	1.8583	7 50 30.2	11.671	2	13 53 19.15	2.0618	16 28 36.7	9.578
3	12 21 36.38	1.8612	8 2 9.8	11.648	3	13 55 23.02	2.0673	16 38 9.3	9.510
4	12 23 28.13	1.8640	8 13 47.9	11.623	4	13 57 27.22	2.0728	16 47 37.9	9.443
5	12 25 20.06	1.8671	8 25 24.5	11.597	5	13 59 31.75	2.0783	16 57 2.4	9.373
6	12 27 12.18	1.8702	8 36 59.5	11.570	6	14 1 36.61	2.0838	17 6 22.7	9.303
7	12 29 4.48	1.8732	8 48 32.9	11.543	7	14 3 41.80	2.0893	17 15 38.8	9.233
8	12 30 56.96	1.8764	9 0 4.6	11.515	8	14 5 47.33	2.0960	17 24 50.6	9.160
9	12 32 49.65	1.8797	9 11 34.7	11.487	9	14 7 53.20	2.1007	17 33 58.0	9.087
10	12 34 42.52	1.8829	9 23 3.0	11.457	10	14 9 59.41	2.1064	17 43 1.0	9.013
11	12 36 35.60	1.8863	9 34 29.5	11.427	11	14 12 5.97	2.1121	17 51 59.5	8.937
12	12 38 28.88	1.8896	9 45 54.2	11.396	12	14 14 12.86	2.1178	18 0 53.4	8.860
13	12 40 22.37	1.8933	9 57 17.0	11.364	13	14 16 20.10	2.1235	18 9 42.7	8.783
14	12 42 16.07	1.8968	10 8 37.9	11.332	14	14 18 27.68	2.1293	18 18 27.3	8.703
15	12 44 9.98	1.9003	10 19 56.8	11.298	15	14 20 35.62	2.1352	18 27 7.1	8.623
16	12 46 4.11	1.9041	10 31 13.7	11.265	16	14 22 43.90	2.1409	18 35 42.0	8.542
17	12 47 58.47	1.9078	10 42 28.6	11.230	17	14 24 52.53	2.1468	18 44 12.1	8.460
18	12 49 53.05	1.9116	10 53 41.3	11.194	18	14 27 1.51	2.1526	18 52 37.2	8.376
19	12 51 47.86	1.9154	11 4 51.9	11.158	19	14 29 10.84	2.1585	19 0 57.2	8.291
20	12 53 42.90	1.9194	11 16 0.2	11.120	20	14 31 20.53	2.1644	19 9 12.1	8.206
21	12 55 38.19	1.9234	11 27 6.3	11.082	21	14 33 30.57	2.1703	19 17 21.9	8.119
22	12 57 33.71	1.9273	11 38 10.0	11.043	22	14 35 40.96	2.1762	19 25 26.4	8.030
23	12 59 29.47	1.9314	11 49 11.4	11.003	23	14 37 51.71	2.1821	19 33 25.5	7.941
24	13 1 25.48	1.9356	-12 0 10.4	-10.963	24	14 40 2.81	2.1880	-19 41 19.3	-7.851

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 11.					DECEMBER 13.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	14 40 2.81	2.1880	-19 41 19.3	-7.851	0	16 31 32.44	2.4406	-23 51 58.2	-2.177
1	14 42 14.27	2.1939	19 49 7.6	7.759	1	16 33 58.99	2.4443	23 54 4.5	2.034
2	14 44 26.08	2.1998	19 56 50.4	7.667	2	16 36 25.76	2.4480	23 56 2.3	1.891
3	14 46 38.25	2.2058	20 4 27.6	7.573	3	16 38 52.75	2.4515	23 57 51.4	1.747
4	14 48 50.77	2.2117	20 11 59.1	7.477	4	16 41 19.94	2.4549	23 59 31.9	1.603
5	14 51 3.65	2.2177	20 19 24.8	7.380	5	16 43 47.34	2.4583	24 1 3.7	1.457
6	14 53 16.89	2.2236	20 26 44.7	7.283	6	16 46 14.94	2.4616	24 2 26.7	1.311
7	14 55 30.48	2.2294	20 33 58.8	7.185	7	16 48 42.73	2.4648	24 3 41.0	1.164
8	14 57 44.42	2.2353	20 41 6.9	7.084	8	16 51 10.71	2.4678	24 4 46.4	1.017
9	14 59 58.72	2.2413	20 48 8.9	6.983	9	16 53 38.86	2.4707	24 5 43.0	0.868
10	15 2 13.37	2.2472	20 55 4.9	6.882	10	16 56 7.19	2.4735	24 6 30.6	0.720
11	15 4 28.38	2.2530	21 1 54.7	6.778	11	16 58 35.68	2.4763	24 7 9.4	0.572
12	15 6 43.73	2.2588	21 8 38.2	6.673	12	17 1 4.34	2.4789	24 7 39.2	0.422
13	15 8 59.44	2.2647	21 15 15.5	6.568	13	17 3 33.15	2.4814	24 8 0.0	0.272
14	15 11 15.49	2.2705	21 21 46.3	6.460	14	17 6 2.11	2.4838	24 8 11.8	-0.122
15	15 13 31.90	2.2763	21 28 10.7	6.353	15	17 8 31.20	2.4860	24 8 14.6	+0.029
16	15 15 48.65	2.2821	21 34 28.6	6.243	16	17 11 0.43	2.4883	24 8 8.3	0.181
17	15 18 5.75	2.2878	21 40 39.8	6.132	17	17 13 29.79	2.4903	24 7 52.9	0.333
18	15 20 23.19	2.2935	21 46 44.4	6.021	18	17 15 59.27	2.4923	24 7 28.4	0.484
19	15 22 40.97	2.2992	21 52 42.3	5.908	19	17 18 28.86	2.4940	24 6 54.8	0.637
20	15 24 59.09	2.3048	21 58 33.4	5.794	20	17 20 58.55	2.4957	24 6 12.0	0.790
21	15 27 17.55	2.3104	22 4 17.6	5.679	21	17 23 28.34	2.4973	24 5 20.0	0.943
22	15 29 36.34	2.3159	22 9 54.9	5.563	22	17 25 58.23	2.4989	24 4 18.9	1.095
23	15 31 55.46	2.3215	-22 15 25.1	-5.445	23	17 28 28.21	2.5003	-24 3 8.6	+1.248
DECEMBER 12.					DECEMBER 14.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	15 34 14.92	2.3271	-22 20 48.3	-5.327	0	17 30 58.26	2.5014	-24 1 49.1	+1.402
1	15 36 34.71	2.3325	22 26 4.3	5.208	1	17 33 28.38	2.5026	24 0 20.4	1.556
2	15 38 54.82	2.3378	22 31 13.2	5.088	2	17 35 58.57	2.5036	23 58 42.4	1.710
3	15 41 15.25	2.3432	22 36 14.8	4.965	3	17 38 28.81	2.5044	23 56 55.2	1.863
4	15 43 36.00	2.3485	22 41 9.0	4.842	4	17 40 59.10	2.5053	23 54 58.8	2.018
5	15 45 57.07	2.3538	22 45 55.8	4.718	5	17 43 29.44	2.5059	23 52 53.1	2.172
6	15 48 18.45	2.3590	22 50 35.2	4.593	6	17 45 59.81	2.5064	23 50 38.2	2.325
7	15 50 40.15	2.3642	22 55 7.0	4.467	7	17 48 30.21	2.5068	23 48 14.1	2.479
8	15 53 2.15	2.3692	22 59 31.2	4.340	8	17 51 0.63	2.5072	23 45 40.7	2.633
9	15 55 24.45	2.3742	23 3 47.8	4.213	9	17 53 31.07	2.5073	23 42 58.1	2.787
10	15 57 47.05	2.3791	23 7 56.7	4.083	10	17 56 1.51	2.5074	23 40 6.3	2.941
11	16 0 9.94	2.3840	23 11 57.8	3.953	11	17 58 31.96	2.5074	23 37 5.2	3.094
12	16 2 33.13	2.3889	23 15 51.1	3.823	12	18 1 2.40	2.5073	23 33 55.0	3.247
13	16 4 56.61	2.3936	23 19 36.5	3.690	13	18 3 32.83	2.5069	23 30 35.6	3.401
14	16 7 20.36	2.3983	23 23 13.9	3.556	14	18 6 3.23	2.5065	23 27 6.9	3.553
15	16 9 44.40	2.4029	23 26 43.2	3.423	15	18 8 33.61	2.5060	23 23 29.2	3.706
16	16 12 8.71	2.4073	23 30 4.6	3.288	16	18 11 3.95	2.5054	23 19 42.2	3.858
17	16 14 33.28	2.4118	23 33 17.8	3.152	17	18 13 34.26	2.5048	23 15 46.2	4.010
18	16 16 58.12	2.4163	23 36 22.8	3.014	18	18 16 4.52	2.5038	23 11 41.0	4.163
19	16 19 23.23	2.4205	23 39 19.5	2.877	19	18 18 34.72	2.5029	23 7 26.7	4.313
20	16 21 48.58	2.4247	23 42 8.0	2.739	20	18 21 4.87	2.5019	23 3 3.4	4.463
21	16 24 14.19	2.4288	23 44 48.2	2.600	21	18 23 34.95	2.5008	22 58 31.1	4.614
22	16 26 40.03	2.4328	23 47 20.0	2.459	22	18 26 4.96	2.4995	22 53 49.7	4.765
23	16 29 6.12	2.4368	23 49 43.3	2.318	23	18 28 34.89	2.4982	22 48 59.3	4.914
24	16 31 32.44	2.4406	-23 51 58.2	-2.177	24	18 31 4.74	2.4967	-22 44 0.0	+5.063

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 15.					DECEMBER 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 31 4.74	2.4967	-22 44 0.0	+5.063	0	20 27 45.64	2.3453	-16 5 9.4	+11.143
1	18 33 34.49	2.4961	22 38 51.8	5.211	1	20 30 6.24	2.3414	15 53 57.9	11.240
2	18 36 4.15	2.4935	22 33 34.7	5.359	2	20 32 26.61	2.3374	15 42 40.6	11.335
3	18 38 33.71	2.4917	22 28 8.7	5.507	3	20 34 46.73	2.3335	15 31 17.7	11.430
4	18 41 8.15	2.4898	22 22 33.9	5.653	4	20 37 6.63	2.3296	15 19 49.0	11.523
5	18 43 32.49	2.4879	22 16 50.4	5.798	5	20 39 26.28	2.3256	15 8 14.9	11.614
6	18 46 1.70	2.4868	22 10 58.1	5.944	6	20 41 45.70	2.3218	14 56 35.3	11.705
7	18 48 30.79	2.4838	22 4 57.1	6.088	7	20 44 4.89	2.3178	14 44 50.3	11.793
8	18 50 59.75	2.4816	21 58 47.5	6.232	8	20 46 23.84	2.3138	14 33 0.1	11.881
9	18 53 28.58	2.4793	21 52 29.3	6.375	9	20 48 42.55	2.3100	14 21 4.6	11.968
10	18 55 57.26	2.4768	21 46 2.5	6.518	10	20 51 1.04	2.3063	14 9 4.0	12.052
11	18 58 25.80	2.4744	21 39 27.2	6.660	11	20 53 19.30	2.3023	13 56 58.4	12.134
12	19 0 54.19	2.4718	21 32 43.4	6.800	12	20 55 37.32	2.2985	13 44 47.9	12.216
13	19 3 22.42	2.4692	21 25 51.2	6.939	13	20 57 55.12	2.2948	13 32 32.5	12.296
14	19 5 50.49	2.4668	21 18 50.7	7.078	14	21 0 12.69	2.2909	13 20 12.4	12.374
15	19 8 18.40	2.4638	21 11 41.9	7.216	15	21 2 30.03	2.2872	13 7 47.6	12.452
16	19 10 46.14	2.4608	21 4 24.8	7.353	16	21 4 47.15	2.2835	12 55 18.2	12.528
17	19 13 13.70	2.4579	20 56 59.5	7.489	17	21 7 4.05	2.2798	12 42 44.2	12.603
18	19 15 41.09	2.4550	20 49 26.1	7.624	18	21 9 20.73	2.2763	12 30 5.9	12.675
19	19 18 8.90	2.4520	20 41 44.6	7.758	19	21 11 37.20	2.2726	12 17 23.2	12.747
20	19 20 35.33	2.4498	20 33 55.1	7.892	20	21 13 53.44	2.2689	12 4 36.3	12.817
21	19 23 2.16	2.4457	20 25 57.6	8.024	21	21 16 9.47	2.2654	11 51 45.2	12.885
22	19 25 28.81	2.4425	20 17 52.2	8.155	22	21 18 25.29	2.2620	11 38 50.1	12.953
23	19 27 55.26	2.4392	-20 9 39.0	+8.284	23	21 20 40.91	2.2585	-11 25 50.9	+13.018
DECEMBER 16.					DECEMBER 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 30 21.51	2.4358	-20 1 18.1	+8.413	0	21 22 56.31	2.2550	-11 12 47.9	+13.082
1	19 32 47.56	2.4324	19 52 49.4	8.542	1	21 25 11.51	2.2517	10 59 41.1	13.145
2	19 35 13.40	2.4290	19 44 13.1	8.668	2	21 27 26.51	2.2483	10 46 30.5	13.207
3	19 37 39.04	2.4255	19 35 29.3	8.793	3	21 29 41.31	2.2450	10 33 16.3	13.266
4	19 40 4.46	2.4219	19 26 37.9	8.918	4	21 31 55.91	2.2418	10 19 58.6	13.324
5	19 42 29.67	2.4184	19 17 39.1	9.041	5	21 34 10.32	2.2385	10 6 37.4	13.382
6	19 44 54.67	2.4148	19 8 33.0	9.163	6	21 36 24.53	2.2353	9 53 12.8	13.438
7	19 47 19.44	2.4111	18 59 19.5	9.284	7	21 38 38.56	2.2323	9 39 44.9	13.491
8	19 49 44.00	2.4074	18 49 58.9	9.403	8	21 40 52.40	2.2292	9 26 13.9	13.543
9	19 52 8.33	2.4037	18 40 31.1	9.523	9	21 43 6.06	2.2262	9 12 39.7	13.595
10	19 54 32.44	2.3999	18 30 56.2	9.639	10	21 45 19.54	2.2232	8 59 2.5	13.644
11	19 56 56.32	2.3962	18 21 14.4	9.755	11	21 47 32.84	2.2203	8 45 22.4	13.693
12	19 59 19.98	2.3924	18 11 25.6	9.870	12	21 49 45.97	2.2174	8 31 39.4	13.739
13	20 1 43.41	2.3885	18 1 30.0	9.983	13	21 51 58.93	2.2146	8 17 53.7	13.785
14	20 4 6.60	2.3846	17 51 27.7	10.095	14	21 54 11.72	2.2118	8 4 5.2	13.829
15	20 6 29.56	2.3808	17 41 18.6	10.206	15	21 56 24.35	2.2092	7 50 14.2	13.871
16	20 8 52.29	2.3769	17 31 3.0	10.315	16	21 58 36.82	2.2065	7 36 20.7	13.913
17	20 11 14.79	2.3730	17 20 40.8	10.423	17	22 0 49.13	2.2039	7 22 24.7	13.953
18	20 13 37.05	2.3690	17 10 12.2	10.530	18	22 3 1.29	2.2014	7 8 26.4	13.990
19	20 15 59.07	2.3651	16 59 37.2	10.636	19	22 5 13.30	2.1989	6 54 25.9	14.027
20	20 18 20.86	2.3612	16 48 55.9	10.740	20	22 7 25.16	2.1965	6 40 23.2	14.063
21	20 20 42.41	2.3573	16 38 8.4	10.843	21	22 9 36.88	2.1943	6 26 18.4	14.097
22	20 23 3.73	2.3533	16 27 14.7	10.945	22	22 11 48.47	2.1919	6 12 11.6	14.129
23	20 25 24.80	2.3493	16 16 15.0	11.044	23	22 13 59.91	2.1897	5 58 2.9	14.161
24	20 27 45.64	2.3453	-16 5 9.4	+11.143	24	22 16 11.23	2.1876	-5 43 52.3	+14.191

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 19.					DECEMBER 21.				
	^h ^m ^s	^s	[°] ' "	"		^h ^m ^s	^s	[°] ' "	"
0	22 16 11.23	2.1876	-5 43 52.3	+14.191	0	23 59 58.31	2.1632	+5 45 37.7	+14.028
1	22 18 22.42	2.1854	5 29 40.0	14.218	1	0 2 8.13	2.1643	5 59 38.3	13.992
2	22 20 33.48	2.1833	5 15 26.1	14.246	2	0 4 18.03	2.1656	6 13 36.7	13.955
3	22 22 44.42	2.1814	5 1 10.5	14.272	3	0 6 28.00	2.1668	6 27 32.9	13.917
4	22 24 55.25	2.1796	4 46 53.5	14.295	4	0 8 38.05	2.1682	6 41 26.7	13.878
5	22 27 5.97	2.1777	4 32 35.1	14.318	5	0 10 48.18	2.1695	6 55 18.2	13.838
6	22 29 16.57	2.1759	4 18 15.3	14.340	6	0 12 58.39	2.1710	7 9 7.2	13.795
7	22 31 27.08	2.1743	4 3 54.3	14.359	7	0 15 8.70	2.1726	7 22 53.6	13.752
8	22 33 37.48	2.1725	3 49 32.2	14.378	8	0 17 19.10	2.1742	7 36 37.4	13.708
9	22 35 47.78	2.1710	3 35 8.9	14.396	9	0 19 29.60	2.1758	7 50 18.5	13.662
10	22 37 58.00	2.1695	3 20 44.7	14.412	10	0 21 40.20	2.1775	8 3 56.8	13.615
11	22 40 8.12	2.1680	3 6 19.5	14.427	11	0 23 50.90	2.1793	8 17 32.3	13.568
12	22 42 18.16	2.1667	2 51 53.5	14.439	12	0 26 1.71	2.1811	8 31 4.9	13.518
13	22 44 28.12	2.1654	2 37 26.8	14.452	13	0 28 12.63	2.1830	8 44 34.4	13.467
14	22 46 38.01	2.1642	2 22 59.3	14.462	14	0 30 23.67	2.1849	8 58 0.9	13.415
15	22 48 47.82	2.1629	2 8 31.4	14.470	15	0 32 34.82	2.1868	9 11 24.2	13.362
16	22 50 57.56	2.1618	1 54 2.9	14.479	16	0 34 46.09	2.1889	9 24 44.3	13.307
17	22 53 7.24	2.1610	1 39 33.9	14.485	17	0 36 57.49	2.1911	9 38 1.0	13.251
18	22 55 16.86	2.1601	1 25 4.7	14.490	18	0 39 9.02	2.1932	9 51 14.4	13.194
19	22 57 26.43	2.1590	1 10 35.1	14.494	19	0 41 20.67	2.1953	10 4 24.3	13.136
20	22 59 35.94	2.1582	0 56 5.4	14.496	20	0 43 32.46	2.1976	10 17 30.7	13.077
21	23 1 45.41	2.1574	0 41 35.6	14.497	21	0 45 44.38	2.1999	10 30 33.5	13.017
22	23 3 54.83	2.1567	0 27 5.8	14.497	22	0 47 56.45	2.2023	10 43 32.7	12.954
23	23 6 4.21	2.1561	-0 12 36.0	+14.495	23	0 50 8.65	2.2046	+10 56 28.0	+12.891
DECEMBER 20.					DECEMBER 22.				
0	23 8 13.56	2.1556	+0 1 53.6	+14.492	0	0 52 21.00	2.2071	+11 9 19.6	+12.827
1	23 10 22.88	2.1551	0 16 23.0	14.488	1	0 54 33.50	2.2096	11 22 7.2	12.761
2	23 12 32.17	2.1547	0 30 52.1	14.482	2	0 56 46.15	2.2121	11 34 50.9	12.694
3	23 14 41.44	2.1543	0 45 20.8	14.475	3	0 58 58.95	2.2147	11 47 30.5	12.626
4	23 16 50.69	2.1541	0 59 49.1	14.467	4	1 1 11.91	2.2173	12 0 6.0	12.556
5	23 18 59.93	2.1539	1 14 16.8	14.458	5	1 3 25.03	2.2200	12 12 37.2	12.485
6	23 21 9.16	2.1538	1 28 44.0	14.447	6	1 5 38.31	2.2227	12 25 4.2	12.414
7	23 23 18.38	2.1537	1 43 10.4	14.433	7	1 7 51.75	2.2254	12 37 26.9	12.341
8	23 25 27.60	2.1538	1 57 36.0	14.420	8	1 10 5.36	2.2283	12 49 45.1	12.267
9	23 27 36.83	2.1538	2 12 0.8	14.406	9	1 12 19.14	2.2310	13 1 58.9	12.191
10	23 29 46.06	2.1539	2 26 24.7	14.390	10	1 14 33.08	2.2338	13 14 8.0	12.114
11	23 31 55.30	2.1542	2 40 47.6	14.373	11	1 16 47.20	2.2368	13 26 12.6	12.037
12	23 34 4.56	2.1545	2 55 9.4	14.353	12	1 19 1.49	2.2397	13 38 12.4	11.957
13	23 36 13.84	2.1548	3 9 30.0	14.333	13	1 21 15.96	2.2426	13 50 7.4	11.877
14	23 38 23.14	2.1552	3 23 49.4	14.312	14	1 23 30.60	2.2456	14 1 57.6	11.796
15	23 40 32.46	2.1557	3 38 7.4	14.289	15	1 25 45.43	2.2486	14 13 42.9	11.713
16	23 42 41.82	2.1563	3 52 24.1	14.266	16	1 28 0.43	2.2516	14 25 23.1	11.628
17	23 44 51.22	2.1569	4 6 39.3	14.240	17	1 30 15.62	2.2547	14 36 58.3	11.543
18	23 47 0.65	2.1576	4 20 52.9	14.213	18	1 32 30.99	2.2578	14 48 28.3	11.458
19	23 49 10.13	2.1583	4 35 4.9	14.186	19	1 34 46.55	2.2608	14 59 53.2	11.370
20	23 51 19.65	2.1592	4 49 15.2	14.157	20	1 37 2.29	2.2640	15 11 12.7	11.280
21	23 53 29.23	2.1601	5 3 23.7	14.126	21	1 39 18.23	2.2672	15 22 26.8	11.191
22	23 55 38.86	2.1610	5 17 30.3	14.094	22	1 41 34.35	2.2703	15 33 35.6	11.100
23	23 57 48.55	2.1621	5 31 35.0	14.062	23	1 43 50.66	2.2734	15 44 38.8	11.008
24	23 59 58.31	2.1632	+5 45 37.7	+14.028	24	1 46 7.16	2.2767	+15 55 36.5	+10.914

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 23.					DECEMBER 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 46 7.16	2.2767	+15 55 36.5	+10.914	0	3 38 56.14	2.4122	+22 31 48.8	+5.239
1	1 48 23.86	2.2798	16 6 28.5	10.820	1	3 41 20.92	2.4138	22 36 59.0	5.102
2	1 50 40.74	2.2831	16 17 14.9	10.724	2	3 43 45.80	2.4154	22 42 1.0	4.963
3	1 52 57.83	2.2863	16 27 55.4	10.627	3	3 46 10.77	2.4170	22 46 54.6	4.824
4	1 55 15.10	2.2895	16 38 30.1	10.529	4	3 48 35.84	2.4184	22 51 39.9	4.685
5	1 57 32.57	2.2928	16 48 58.9	10.431	5	3 51 0.98	2.4198	22 56 16.8	4.545
6	1 59 50.24	2.2961	16 59 21.8	10.330	6	3 53 26.21	2.4211	23 0 45.3	4.404
7	2 2 8.10	2.2993	17 9 38.5	10.228	7	3 55 51.51	2.4223	23 5 5.3	4.263
8	2 4 26.16	2.3026	17 19 49.2	10.127	8	3 58 16.89	2.4234	23 9 16.9	4.123
9	2 6 44.41	2.3058	17 29 53.7	10.023	9	4 0 42.32	2.4244	23 13 20.0	3.981
10	2 9 2.85	2.3090	17 39 51.9	9.918	10	4 3 7.82	2.4254	23 17 14.6	3.839
11	2 11 21.49	2.3123	17 49 43.8	9.813	11	4 5 33.37	2.4263	23 21 0.7	3.697
12	2 13 40.33	2.3156	17 59 29.4	9.706	12	4 7 58.97	2.4271	23 24 38.2	3.554
13	2 15 59.36	2.3188	18 9 8.5	9.598	13	4 10 24.62	2.4278	23 28 7.2	3.412
14	2 18 18.59	2.3221	18 18 41.1	9.489	14	4 12 50.30	2.4283	23 31 27.6	3.268
15	2 20 38.01	2.3253	18 28 7.2	9.379	15	4 15 16.02	2.4288	23 34 39.4	3.125
16	2 22 57.62	2.3284	18 37 26.6	9.268	16	4 17 41.76	2.4292	23 37 42.6	2.982
17	2 25 17.42	2.3316	18 46 39.3	9.156	17	4 20 7.52	2.4296	23 40 37.2	2.838
18	2 27 37.41	2.3348	18 55 45.3	9.043	18	4 22 33.30	2.4298	23 43 23.2	2.694
19	2 29 57.59	2.3379	19 4 44.5	8.928	19	4 24 59.09	2.4299	23 46 0.5	2.550
20	2 32 17.96	2.3411	19 13 36.7	8.813	20	4 27 24.89	2.4299	23 48 29.2	2.407
21	2 34 38.52	2.3442	19 22 22.1	8.698	21	4 29 50.68	2.4298	23 50 49.3	2.262
22	2 36 59.26	2.3472	19 31 0.5	8.581	22	4 32 16.46	2.4297	23 53 0.6	2.117
23	2 39 20.18	2.3503	+19 39 31.8	+8.463	23	4 34 42.24	2.4294	+23 55 3.3	+1.973
DECEMBER 24.					DECEMBER 26.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 41 41.29	2.3533	+19 47 56.0	+8.343	0	4 37 7.99	2.4290	+23 56 57.4	+1.829
1	2 44 2.58	2.3563	19 56 13.0	8.223	1	4 39 33.72	2.4286	23 58 42.8	1.684
2	2 46 24.05	2.3593	20 4 22.8	8.103	2	4 41 59.42	2.4281	24 0 19.5	1.540
3	2 48 45.69	2.3622	20 12 25.4	7.982	3	4 44 25.09	2.4274	24 1 47.6	1.396
4	2 51 7.51	2.3651	20 20 20.6	7.858	4	4 46 50.71	2.4266	24 3 7.0	1.251
5	2 53 29.50	2.3678	20 28 8.4	7.735	5	4 49 16.28	2.4258	24 4 17.7	1.107
6	2 55 51.65	2.3707	20 35 48.8	7.611	6	4 51 41.80	2.4248	24 5 19.8	0.963
7	2 58 13.98	2.3735	20 43 21.7	7.485	7	4 54 7.25	2.4238	24 6 13.3	0.819
8	3 0 36.47	2.3762	20 50 47.0	7.359	8	4 56 32.65	2.4227	24 6 58.1	0.675
9	3 2 59.12	2.3788	20 58 4.8	7.233	9	4 58 57.97	2.4213	24 7 34.3	0.532
10	3 5 21.93	2.3815	21 5 14.9	7.104	10	5 1 23.21	2.4199	24 8 1.9	0.388
11	3 7 44.90	2.3841	21 12 17.3	6.976	11	5 3 48.36	2.4185	24 8 20.9	0.245
12	3 10 8.02	2.3866	21 19 12.0	6.847	12	5 6 13.43	2.4170	24 8 31.3	+0.103
13	3 12 31.29	2.3891	21 25 58.9	6.717	13	5 8 38.40	2.4153	24 8 33.2	-0.040
14	3 14 54.71	2.3915	21 32 38.0	6.586	14	5 11 3.27	2.4137	24 8 26.5	0.183
15	3 17 18.27	2.3938	21 39 9.2	6.453	15	5 13 28.04	2.4118	24 8 11.2	0.325
16	3 19 41.97	2.3962	21 45 32.4	6.322	16	5 15 52.69	2.4098	24 7 47.5	0.466
17	3 22 5.81	2.3983	21 51 47.8	6.189	17	5 18 17.22	2.4078	24 7 15.3	0.607
18	3 24 29.77	2.4005	21 57 55.1	6.055	18	5 20 41.63	2.4057	24 6 34.7	0.748
19	3 26 53.87	2.4027	22 3 54.4	5.921	19	5 23 5.90	2.4034	24 5 45.5	0.889
20	3 29 18.09	2.4048	22 9 45.6	5.785	20	5 25 30.04	2.4012	24 4 48.0	1.028
21	3 31 42.44	2.4067	22 15 28.6	5.649	21	5 27 54.04	2.3988	24 3 42.1	1.168
22	3 34 6.89	2.4085	22 21 3.5	5.514	22	5 30 17.89	2.3963	24 2 27.8	1.308
23	3 36 31.46	2.4104	22 26 30.3	5.378	23	5 32 41.59	2.3937	24 1 5.2	1.446
24	3 38 56.14	2.4122	+22 31 48.8	+5.239	24	5 35 5.13	2.3910	+23 59 34.3	-1.584

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 27.					DECEMBER 29.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	5 35 5.13	2.3910	+23 59 34.8	-1.584	0	7 25 23.44	2.1849	+20 18 21.5	-7.289
1	5 37 28.51	2.3863	23 57 55.1	1.723	1	7 27 34.38	2.1798	20 11 1.3	7.385
2	5 39 51.72	2.3863	23 56 7.7	1.858	2	7 29 45.01	2.1745	20 3 35.3	7.479
3	5 42 14.75	2.3824	23 54 12.1	1.996	3	7 31 55.32	2.1693	19 56 3.8	7.572
4	5 44 37.61	2.3794	23 52 8.3	2.131	4	7 34 5.32	2.1640	19 48 26.7	7.664
5	5 47 0.28	2.3763	23 49 56.4	2.266	5	7 36 15.00	2.1588	19 40 44.1	7.754
6	5 49 22.77	2.3732	23 47 36.4	2.401	6	7 38 24.37	2.1536	19 32 56.2	7.844
7	5 51 45.06	2.3696	23 45 8.3	2.535	7	7 40 33.43	2.1483	19 25 2.8	7.934
8	5 54 7.15	2.3666	23 42 32.2	2.668	8	7 42 42.16	2.1430	19 17 4.1	8.021
9	5 56 29.04	2.3631	23 39 48.1	2.801	9	7 44 50.59	2.1378	19 9 0.3	8.108
10	5 58 50.72	2.3595	23 36 56.1	2.933	10	7 46 58.70	2.1325	19 0 51.2	8.193
11	6 1 12.18	2.3559	23 33 56.2	3.063	11	7 49 6.49	2.1273	18 52 37.1	8.278
12	6 3 33.43	2.3523	23 30 48.5	3.193	12	7 51 13.97	2.1221	18 44 17.9	8.361
13	6 5 54.45	2.3485	23 27 35.0	3.323	13	7 53 21.14	2.1169	18 35 53.8	8.443
14	6 8 15.25	2.3448	23 24 9.7	3.453	14	7 55 28.00	2.1117	18 27 24.7	8.525
15	6 10 35.82	2.3406	23 20 38.7	3.580	15	7 57 34.54	2.1064	18 18 50.8	8.604
16	6 12 56.15	2.3369	23 17 0.1	3.708	16	7 59 40.77	2.1013	18 10 12.2	8.683
17	6 15 16.25	2.3329	23 13 13.8	3.834	17	8 1 46.70	2.0962	18 1 28.8	8.763
18	6 17 36.10	2.3288	23 9 20.0	3.960	18	8 3 52.31	2.0909	17 52 40.7	8.839
19	6 19 55.70	2.3247	23 5 18.6	4.085	19	8 5 57.61	2.0856	17 43 48.1	8.915
20	6 22 15.06	2.3205	23 1 9.8	4.208	20	8 8 2.61	2.0803	17 34 50.9	8.990
21	6 24 34.16	2.3163	22 56 53.6	4.331	21	8 10 7.30	2.0757	17 25 49.3	9.063
22	6 26 53.01	2.3119	22 52 30.1	4.453	22	8 12 11.69	2.0706	17 16 49.3	9.137
23	6 29 11.59	2.3075	+22 47 59.2	-4.575	23	8 14 15.77	2.0655	+17 7 32.9	-9.209
DECEMBER 28.					DECEMBER 30.				
	^h ^m ^s	^s	[°] ['] ["]	["]		^h ^m ^s	^s	[°] ['] ["]	["]
0	6 31 29.91	2.3031	+22 43 21.1	-4.696	0	8 16 19.55	2.0605	+16 58 18.2	-9.279
1	6 33 47.96	2.2986	22 38 35.8	4.815	1	8 18 23.08	2.0555	16 48 59.4	9.348
2	6 36 5.74	2.2941	22 33 43.3	4.933	2	8 20 26.21	2.0505	16 39 36.4	9.418
3	6 38 23.25	2.2895	22 28 43.8	5.050	3	8 22 29.09	2.0456	16 30 9.3	9.485
4	6 40 40.48	2.2848	22 23 37.3	5.168	4	8 24 31.68	2.0407	16 20 38.2	9.552
5	6 42 57.43	2.2802	22 18 23.7	5.283	5	8 26 33.97	2.0358	16 11 3.1	9.618
6	6 45 14.10	2.2754	22 13 3.3	5.398	6	8 28 35.97	2.0309	16 1 24.1	9.682
7	6 47 30.48	2.2707	22 7 36.0	5.512	7	8 30 37.68	2.0261	15 51 41.3	9.745
8	6 49 46.58	2.2658	22 2 1.9	5.624	8	8 32 39.10	2.0213	15 41 54.7	9.808
9	6 52 2.38	2.2610	21 56 21.1	5.737	9	8 34 40.23	2.0165	15 32 4.3	9.870
10	6 54 17.90	2.2562	21 50 33.5	5.848	10	8 36 41.08	2.0118	15 22 10.3	9.930
11	6 56 33.12	2.2512	21 44 39.4	5.957	11	8 38 41.64	2.0070	15 12 12.7	9.990
12	6 58 48.04	2.2463	21 38 38.7	6.066	12	8 40 41.92	2.0024	15 2 11.5	10.049
13	7 1 2.67	2.2413	21 32 31.5	6.173	13	8 42 41.93	1.9978	14 52 6.8	10.106
14	7 3 16.99	2.2362	21 26 17.9	6.280	14	8 44 41.65	1.9932	14 41 58.8	10.163
15	7 5 31.01	2.2313	21 19 57.9	6.386	15	8 46 41.11	1.9887	14 31 47.3	10.219
16	7 7 44.74	2.2262	21 13 31.6	6.490	16	8 48 40.29	1.9842	14 21 32.5	10.273
17	7 9 58.15	2.2210	21 6 59.1	6.594	17	8 50 39.21	1.9797	14 11 14.5	10.327
18	7 12 11.26	2.2160	21 0 20.3	6.697	18	8 52 37.85	1.9752	14 0 53.3	10.380
19	7 14 24.07	2.2108	20 53 35.5	6.798	19	8 54 36.23	1.9709	13 50 28.9	10.433
20	7 16 36.56	2.2057	20 46 44.6	6.899	20	8 56 34.36	1.9666	13 40 1.4	10.483
21	7 18 48.75	2.2005	20 39 47.6	6.998	21	8 58 32.22	1.9622	13 29 30.9	10.533
22	7 21 0.62	2.1953	20 32 44.8	7.097	22	9 0 29.82	1.9579	13 18 57.4	10.583
23	7 23 12.19	2.1902	20 25 36.0	7.194	23	9 2 27.17	1.9538	13 8 21.0	10.631
24	7 25 23.44	2.1849	+20 18 21.5	-7.289	24	9 4 24.27	1.9496	+12 57 41.7	-10.678

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 31.					DECEMBER 31.				
	^h ^m ^s		[°] ['] ["]			^h ^m ^s		[°] ['] ["]	
0	9 4 24.27	1.9406	+12 57 41.7	-10.678	12	9 27 30.92	1.9034	+10 46 25.8	-11.178
1	9 6 21.12	1.9455	12 46 59.6	10.725	13	9 29 25.02	1.8999	10 35 14.0	11.214
2	9 8 17.73	1.9414	12 36 14.7	10.770	14	9 31 18.91	1.8964	10 24 0.1	11.249
3	9 10 14.09	1.9373	12 25 27.2	10.815	15	9 33 12.59	1.8931	10 12 44.1	11.283
4	9 12 10.21	1.9334	12 14 36.9	10.860	16	9 35 6.08	1.8896	10 1 26.1	11.318
5	9 14 6.10	1.9295	12 3 44.1	10.902	17	9 36 59.36	1.8863	9 50 6.0	11.351
6	9 16 1.75	1.9256	11 52 48.7	10.943	18	9 38 52.44	1.8832	9 38 44.0	11.383
7	9 17 57.17	1.9218	11 41 50.9	10.985	19	9 40 45.34	1.8800	9 27 20.1	11.414
8	9 19 52.36	1.9180	11 30 50.5	11.026	20	9 42 38.04	1.8768	9 15 54.3	11.444
9	9 21 47.33	1.9143	11 19 47.8	11.065	21	9 44 30.56	1.8738	9 4 26.8	11.474
10	9 23 42.08	1.9107	11 8 42.7	11.103	22	9 46 23.89	1.8707	8 52 57.4	11.503
11	9 25 36.61	1.9070	10 57 35.4	11.141	23	9 48 15.04	1.8678	8 41 26.4	11.531
12	9 27 30.92	1.9034	+10 46 25.8	-11.178	24	9 50 7.02	1.8645	+ 8 29 53.7	-11.558

PHASES OF THE MOON.

○ Full Moon	Jan.	d h m	Apr.	d h m	July	d h m	Sept.	d h m
(Last Quarter		15 23 42.1		14 8 12.0		11 0 11.9	Oct.	7 10 14.3
● New Moon		22 19 40.0		21 2 1.3		18 15 0.1		15 14 41.0
) First Quarter		29 13 1.5		28 17 22.0		26 18 40.4		23 2 37.7
○ Full Moon	Feb.	6 15 28.4	May	6 14 43.3	Aug.	2 17 10.9		29 18 19.2
(Last Quarter		14 13 53.2		13 13 47.9		9 7 56.4	Nov.	6 5 3.5
● New Moon		21 6 9.0		20 12 46.8		17 6 21.0		14 6 28.5
) First Quarter		28 4 43.7		28 11 33.5		25 7 8.2		21 10 28.8
○ Full Moon	Mar.	8 9 58.0	June	5 1 6.7	Sept.	1 0 28.5		28 6 41.3
(Last Quarter		16 0 33.1		11 18 38.5		7 19 5.2	Dec.	6 2 13.8
● New Moon		22 16 5.0		19 1 2.2		15 22 27.5		13 21 17.3
) First Quarter		29 22 36.4		27 4 8.4		23 17 41.4		20 18 7.3
○ Full Moon	Apr.	7 1 48.8	July	4 9 40.5	Oct.	30 8 31.1		27 21 51.6
(Last Quarter		14 8 12.0		11 0 11.9		7 10 14.3		

APOGEE.

	d h
January	9 20.4
February	5 20.7
March	5 2.9
April	1 19.2
April	29 14.2
May	27 9.4
June	24 3.1

	d h
July	21 17.6
August	18 0.5
September	14 2.7
October	11 12.5
November	8 5.4
December	6 2.3

PERIGEE.

	d h
January	23 0.6
February	20 13.3
March	20 21.2
April	17 15.2
May	13 6.6
June	8 8.2
July	6 3.6

	d h
August	3 9.9
August	31 19.9
September	29 6.1
October	27 10.8
November	23 18.5
December	18 10.2

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		" ' "	" ' "	" "	" "	" "	d			h m	m	
Jan.	1.0	22 50 37.6	+5 17 1.2	15 36.4	57 10.73	-1.810	7.6	Jan.	1	U	6 47.4	2.01
	1.5	29 24 53.3	5 13 6.2	15 30.6	56 49.55	1.718	8.1		1	L	19 11.6	2.03
	2.0	35 54 31.8	5 5 12.4	15 25.2	56 29.55	1.615	8.6		2	U	7 36.2	2.06
	2.5	42 19 50.8	4 53 33.4	15 20.1	56 10.81	1.508	9.1		2	L	20 1.2	2.10
	3.0	48 41 8.7	4 38 24.2	15 15.3	55 53.38	1.396	9.6		3	U	8 26.5	2.13
	3.5	54 58 43.7	+4 20 1.2	15 10.9	55 37.30	-1.286	10.1		3	L	20 52.2	2.15
	4.0	61 12 54.5	3 58 42.0	15 6.9	55 22.51	1.175	10.6		4	U	9 18.1	2.16
	4.5	67 23 58.6	3 34 44.9	15 3.2	55 9.01	1.070	11.1		4	L	21 44.1	2.17
	5.0	73 32 13.1	3 8 29.1	14 59.9	54 56.80	0.969	11.6		5	U	10 10.1	2.16
	5.5	79 37 54.2	2 40 14.4	14 56.9	54 45.73	0.872	12.1		5	L	22 36.0	2.14
	6.0	85 41 17.2	+2 10 21.1	14 54.2	54 35.85	-0.774	12.6		6	U	11 1.6	2.12
	6.5	91 42 37.4	1 39 9.7	14 51.8	54 27.12	0.682	13.1		6	L	23 26.8	2.09
	7.0	97 42 9.2	1 7 1.4	14 49.7	54 19.49	0.589	13.6		7	U	11 51.5	2.05
	7.5	103 40 7.1	0 34 16.8	14 48.0	54 12.98	0.495	14.1				.....	...
	8.0	109 36 45.5	+0 1 16.6	14 46.5	54 7.61	0.400	14.6		8	L	0 15.6	1.98
	8.5	115 32 19.0	-0 31 38.6	14 45.3	54 3.41	-0.300	15.1		8	U	12 39.0	1.93
	9.0	121 27 3.0	1 4 8.8	14 44.5	54 0.44	0.195	15.6		9	L	1 1.8	1.88
	9.5	127 21 13.5	1 35 54.5	14 44.1	53 58.76	-0.083	16.1		9	U	13 24.1	1.83
	10.0	133 15 7.7	2 6 37.0	14 44.0	53 58.47	+0.037	16.6		10	L	1 45.7	1.79
	10.5	139 9 4.0	2 35 58.1	14 44.3	53 59.67	0.165	17.1		10	U	14 6.9	1.75
	11.0	145 3 22.0	-3 3 40.7	14 45.1	54 2.47	+0.303	17.6		11	L	2 27.6	1.71
	11.5	150 58 23.3	3 29 28.1	14 46.3	54 6.98	0.450	18.1		11	U	14 48.0	1.69
	12.0	156 54 30.9	3 53 4.7	14 48.0	54 13.31	0.606	18.6		12	L	3 8.3	1.68
	12.5	162 52 9.5	4 14 15.6	14 50.3	54 21.58	0.774	19.1		12	U	15 28.4	1.68
	13.0	168 51 45.4	4 32 46.6	14 53.1	54 31.90	0.947	19.6		13	L	3 48.6	1.69
	13.5	174 53 46.8	-4 48 24.2	14 56.5	54 44.34	+1.127	20.1		13	U	16 9.0	1.71
	14.0	180 58 42.6	5 0 55.3	15 0.5	54 58.97	1.311	20.6		14	L	4 29.6	1.74
	14.5	187 7 3.4	5 10 7.9	15 5.1	55 15.81	1.496	21.1		14	U	16 50.8	1.78
	15.0	193 19 19.9	5 15 50.5	15 10.3	55 34.86	1.678	21.6		15	L	5 12.5	1.84
	15.5	199 36 2.7	5 17 52.4	15 16.0	55 56.05	1.853	22.1		15	U	17 35.0	1.91
	16.0	205 57 42.2	-5 16 3.7	15 22.4	56 19.29	+2.017	22.6		16	L	5 58.4	1.98
	16.5	212 24 47.2	5 10 16.4	15 29.2	56 44.39	2.162	23.1		16	U	18 22.8	2.07
	17.0	218 57 43.9	5 0 23.8	15 36.5	57 11.09	2.284	23.6		17	L	6 48.3	2.13
	17.5	225 36 55.1	4 46 21.9	15 44.1	57 39.09	2.377	24.1		17	U	19 15.1	2.28
	18.0	232 22 39.2	4 28 9.7	15 52.0	58 7.96	2.428	24.6		18	L	7 43.1	2.39
	18.5	239 15 8.1	-4 5 49.9	16 0.0	58 37.18	+2.434	25.1		18	U	20 12.4	2.49
	19.0	246 14 26.5	3 39 30.2	16 7.8	59 6.17	2.388	25.6		19	L	8 42.7	2.56
	19.5	253 20 30.6	3 9 24.1	16 15.5	59 34.28	2.283	26.1		19	U	21 13.9	2.63
	20.0	260 33 6.7	2 35 51.1	16 22.7	60 0.73	2.117	26.6		20	L	9 45.7	2.66
	20.5	267 51 50.2	1 59 17.5	16 29.3	60 24.82	1.889	27.1		20	U	22 17.7	2.67
	21.0	275 16 5.8	-1 20 17.0	16 35.0	60 45.82	+1.600	27.6		21	L	10 49.6	2.65
	21.5	282 45 7.2	-0 39 29.3	16 39.7	61 3.01	1.256	28.1		21	U	23 21.1	2.60
	22.0	290 17 57.7	+0 2 19.8	16 43.2	61 15.80	0.869	28.6				.....	...
	22.5	297 53 32.6	0 44 20.4	16 45.3	61 23.74	0.451	29.1		22	L	11 52.0	2.53
	23.0	305 30 40.0	1 25 40.9	16 46.1	61 26.56	+0.018	0.2		23	U	0 21.9	2.46
	23.5	313 8 4.4	+2 5 29.7	16 45.4	61 24.17	-0.415	0.7		23	L	12 50.9	2.38
	24.0	320 44 29.8	+2 42 57.9	16 43.4	61 16.68	-0.828	1.2		24	U	1 19.0	2.30

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
Jan. 24.0	320 44 29.8	+2 42 57.9	16 43.4	61 16.68	-0.828	1.2	Jan. 24	U	1 19.0	2.30	
24.5	328 18 41.4	3 17 21.3	16 40.1	61 4.41	1.210	1.7	24	L	13 46.2	2.23	
25.0	335 49 29.8	3 48 2.9	16 35.5	60 47.80	1.848	2.2	25	U	2 12.6	2.17	
25.5	343 15 53.5	4 14 32.7	16 30.0	60 27.48	1.890	2.7	25	L	14 38.4	2.12	
26.0	350 37 0.2	4 36 29.7	16 23.6	60 4.12	2.052	3.2	26	U	3 3.6	2.09	
26.5	357 52 8.4	+4 53 41.0	16 16.7	59 38.47	-2.213	3.7	26	L	15 28.5	2.06	
27.0	5 0 48.5	5 6 1.1	16 9.2	59 11.25	2.314	4.2	27	U	3 53.2	2.06	
27.5	12 2 41.9	5 13 31.7	16 1.6	58 43.14	2.360	4.7	27	L	16 17.8	2.06	
28.0	18 57 40.9	5 16 19.7	15 53.9	58 14.80	2.355	5.2	28	U	4 42.4	2.06	
28.5	25 45 47.1	5 14 36.8	15 46.2	57 46.80	2.306	5.7	28	L	17 7.2	2.07	
29.0	32 27 10.6	+5 8 37.0	15 38.8	57 19.59	-2.224	6.2	29	U	5 32.1	2.09	
29.5	39 2 8.7	4 58 37.9	15 31.7	56 53.54	2.113	6.7	29	L	17 57.3	2.11	
30.0	45 31 3.6	4 44 57.8	15 25.0	56 28.98	1.978	7.2	30	U	6 22.8	2.13	
30.5	51 54 21.6	4 27 56.1	15 18.8	56 6.14	1.828	7.7	30	L	18 48.5	2.15	
31.0	58 12 32.0	4 7 52.4	15 13.1	55 45.15	1.669	8.2	31	U	7 14.4	2.16	
31.5	64 26 5.7	+3 45 6.7	15 7.9	55 26.10	-1.504	8.7	31	L	19 40.3	2.17	
Feb. 1.0	70 35 34.2	3 19 59.0	15 3.2	55 9.05	1.338	9.2	Feb. 1	U	8 6.3	2.16	
1.5	76 41 29.3	2 52 49.0	14 59.1	54 53.98	1.172	9.7	1	L	20 32.2	2.14	
2.0	82 44 21.7	2 23 56.3	14 55.6	54 40.89	1.011	10.2	2	U	8 57.8	2.12	
2.5	88 44 41.4	1 53 40.4	14 52.5	54 29.69	0.857	10.7	2	L	21 23.1	2.09	
3.0	94 42 56.4	+1 22 21.0	14 49.9	54 20.30	-0.709	11.2	3	U	9 48.0	2.06	
3.5	100 39 33.6	0 50 17.5	14 47.9	54 12.64	0.568	11.7	3	L	22 12.3	2.00	
4.0	106 34 57.2	+0 17 49.3	14 46.2	54 6.64	0.435	12.2	4	U	10 36.1	1.96	
4.5	112 29 30.1	-0 14 44.3	14 45.0	54 2.18	0.309	12.7	4	L	22 59.2	1.91	
5.0	118 23 32.8	0 47 3.9	14 44.2	53 59.19	0.191	13.2	5	U	11 21.8	1.86	
5.5	124 17 24.4	-1 18 50.2	14 43.8	53 57.57	-0.079	13.7	5	L	23 43.8	1.81	
6.0	130 11 22.4	1 49 44.3	14 43.7	53 57.28	+0.030	14.2	6	U	12 5.4	1.77	
6.5	136 5 42.6	2 19 27.5	14 43.9	53 58.27	0.135	14.7			.....	...
7.0	142 0 39.9	2 47 41.7	14 44.6	54 0.51	0.238	15.2	7	L	0 26.4	1.74	
7.5	147 56 28.4	3 14 9.3	14 45.5	54 3.99	0.342	15.7	7	U	12 47.2	1.71	
8.0	153 53 21.4	-3 38 33.3	14 46.8	54 8.73	+0.448	16.2	8	L	1 7.6	1.69	
8.5	159 51 32.3	4 0 37.8	14 48.4	54 14.74	0.555	16.7	8	U	13 27.9	1.69	
9.0	165 51 14.5	4 20 7.8	14 50.4	54 22.07	0.667	17.2	9	L	1 48.1	1.69	
9.5	171 52 41.9	4 36 49.3	14 52.8	54 30.78	0.785	17.7	9	U	14 8.4	1.70	
10.0	177 56 9.1	4 50 29.6	14 55.6	54 40.94	0.908	18.2	10	L	2 28.9	1.71	
10.5	184 1 51.8	-5 0 57.2	14 58.8	54 52.59	+1.035	18.7	10	U	14 49.6	1.74	
11.0	190 10 7.0	5 8 2.0	15 2.4	55 5.81	1.168	19.2	11	L	3 10.8	1.78	
11.5	196 21 13.0	5 11 35.2	15 6.4	55 20.65	1.305	19.7	11	U	15 32.5	1.84	
12.0	202 35 29.4	5 11 29.5	15 10.9	55 37.14	1.444	20.2	12	L	3 55.0	1.90	
12.5	208 53 17.0	5 7 39.3	15 15.8	55 55.31	1.583	20.7	12	U	16 18.2	1.97	
13.0	215 14 57.6	-5 0 0.6	15 21.2	56 15.13	+1.719	21.2	13	L	4 42.3	2.05	
13.5	221 40 53.9	4 48 31.7	15 27.1	56 36.53	1.847	21.7	13	U	17 7.4	2.14	
14.0	228 11 28.3	4 33 12.6	15 33.3	56 59.40	1.963	22.2	14	L	5 33.6	2.23	
14.5	234 47 2.7	4 14 6.1	15 39.9	57 23.57	2.062	22.7	14	U	18 0.8	2.31	
15.0	241 27 57.7	3 51 18.0	15 46.8	57 48.78	2.137	23.2	15	L	6 29.1	2.40	
15.5	248 14 31.4	-3 24 57.6	15 53.8	58 14.73	+2.183	23.7	15	U	18 58.3	2.47	
16.0	255 6 58.1	-2 55 18.3	16 1.0	58 41.02	+2.191	24.2	16	L	7 28.3	2.53	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" ' "	" ' "	" "	" "	"	d			h m	m	
Feb. 16.0	255 6 58.1	-2 55 18.3	16 1.0	58 41.02	+2.191	24.2	Feb. 16	L	7 28.3	2.53	
16.5	262 5 27.0	2 22 37.8	16 8.1	59 7.15	2.166	24.7	16	U	19 58.9	2.56	
17.0	269 10 1.0	1 47 19.2	16 15.1	59 32.56	2.071	25.2	17	L	8 29.7	2.57	
17.5	276 20 35.1	1 9 50.7	16 21.6	59 56.64	1.932	25.7	17	U	21 0.5	2.56	
18.0	283 36 54.9	-0 30 45.9	16 27.6	60 18.72	1.738	26.2	18	L	9 31.1	2.53	
18.5	290 58 35.7	+0 9 16.3	16 32.9	60 38.13	+1.483	26.7	18	U	22 1.3	2.49	
19.0	298 25 1.8	0 49 32.6	16 37.3	60 54.20	1.183	27.2	19	L	10 30.8	2.43	
19.5	305 55 26.6	1 29 16.1	16 40.6	61 6.33	0.833	27.7	19	U	22 59.6	2.37	
20.0	313 28 52.7	2 7 39.0	16 42.7	61 14.04	0.448	28.2	20	L	11 27.7	2.31	
20.5	321 4 13.7	2 43 53.3	16 43.5	61 16.98	+0.090	28.7	20	U	23 55.1	2.26	
21.0	328 40 16.6	+3 17 13.7	16 43.0	61 14.96	-0.375	29.2			...	...
21.5	336 15 44.4	3 46 59.4	16 41.0	61 8.00	0.782	0.2	21	L	12 22.0	2.21	
22.0	343 49 19.1	4 12 36.5	16 37.9	60 56.28	1.166	0.7	22	U	0 48.3	2.18	
22.5	351 19 45.3	4 33 39.0	16 33.5	60 40.17	1.512	1.2	22	L	13 14.3	2.15	
23.0	358 45 53.7	4 49 49.5	16 28.0	60 20.19	1.809	1.7	23	U	1 40.0	2.13	
23.5	6 6 43.6	+5 0 59.1	16 21.7	59 56.97	-2.051	2.2	23	L	14 5.6	2.13	
24.0	13 21 25.6	5 7 7.8	16 14.7	59 31.20	2.234	2.7	24	U	2 31.1	2.13	
24.5	20 29 21.8	5 8 22.4	16 7.1	59 3.59	2.357	3.2	24	L	14 56.7	2.14	
25.0	27 30 7.5	5 4 55.9	15 59.3	58 34.87	2.420	3.7	25	U	3 22.5	2.15	
25.5	34 23 30.3	4 57 5.6	15 51.4	58 5.78	2.428	4.2	25	L	15 48.4	2.17	
26.0	41 9 29.3	+4 45 12.4	15 43.5	57 36.78	-2.389	4.7	26	U	4 14.5	2.19	
26.5	47 48 14.0	4 29 39.0	15 35.8	57 8.57	2.307	5.2	26	L	16 40.9	2.20	
27.0	54 20 2.5	4 10 48.9	15 28.4	56 41.56	2.191	5.7	27	U	5 7.3	2.21	
27.5	60 45 20.1	3 49 6.0	15 21.5	56 16.11	2.047	6.2	27	L	17 33.9	2.21	
28.0	67 4 37.6	3 24 53.6	15 15.1	55 52.54	1.881	6.7	28	U	6 0.3	2.20	
28.5	73 18 29.6	+2 58 34.4	15 9.2	55 31.05	-1.699	7.2	28	L	18 26.7	2.19	
Mar. 1.0	79 27 33.6	2 30 30.4	15 4.0	55 11.81	1.506	7.7	Mar. 1	U	6 52.8	2.16	
1.5	85 32 28.7	2 1 2.4	14 59.4	54 54.92	1.309	8.2	1	L	19 18.5	2.12	
2.0	91 33 54.1	1 30 30.5	14 55.4	54 40.40	1.112	8.7	2	U	7 43.7	2.08	
2.5	97 32 28.8	0 59 13.9	14 52.1	54 28.24	0.915	9.2	2	L	20 8.4	2.03	
3.0	103 28 51.1	+0 27 31.5	14 49.4	54 18.42	-0.722	9.7	3	U	8 32.6	1.98	
3.5	109 23 37.4	-0 4 18.6	14 47.4	54 10.88	0.536	10.2	3	L	20 56.1	1.93	
4.0	115 17 22.1	0 35 58.4	14 45.9	54 5.50	0.360	10.7	4	U	9 19.0	1.88	
4.5	121 10 37.5	1 7 10.2	14 45.0	54 2.18	0.194	11.2	4	L	21 41.4	1.84	
5.0	127 3 53.0	1 37 36.3	14 44.6	54 0.80	-0.038	11.7	5	U	10 3.2	1.90	
5.5	132 57 35.1	-2 6 59.2	14 44.7	54 1.22	+0.106	12.2	5	L	22 24.6	1.77	
6.0	138 52 7.7	2 35 1.5	14 45.3	54 3.30	0.239	12.7	6	U	10 45.6	1.74	
6.5	144 47 51.5	3 1 25.9	14 46.3	54 6.90	0.360	13.2	6	L	23 6.3	1.72	
7.0	150 45 4.5	3 25 55.4	14 47.7	54 11.90	0.472	13.7	7	U	11 26.8	1.70	
7.5	156 44 1.7	3 48 13.7	14 49.4	54 18.19	0.575	14.2	7	L	23 47.2	1.70	
8.0	162 44 55.6	-4 8 4.8	14 51.4	54 25.64	+0.666	14.7	8	U	12 7.7	1.71	
8.5	168 47 56.5	4 25 13.7	14 53.7	54 34.16	0.753	15.2			...	...
9.0	174 53 12.5	4 39 26.5	14 56.3	54 43.69	0.833	15.7	9	L	0 28.2	1.72	
9.5	181 0 50.3	4 50 30.7	14 59.2	54 54.14	0.908	16.2	9	U	12 49.0	1.74	
10.0	187 10 55.3	4 58 15.3	15 2.3	55 5.49	0.982	16.7	10	L	1 10.1	1.78	
10.5	193 23 32.5	-5 2 31.4	15 5.6	55 17.70	+1.053	17.2	10	U	13 31.7	1.82	
11.0	199 38 46.4	-5 3 11.7	15 9.1	55 30.76	+1.124	17.7	11	L	1 53.9	1.87	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	" ' "	" ' "	" ' "	" ' "	"	d		h m	m	
Mar. 10.0	187 10 55.3	-4 58 15.3	15 2.3	55 5.49	+0.982	16.7	Mar. 10	L 1 10.1	1.78	
10.5	193 23 32.5	5 2 31.4	15 5.6	55 17.70	1.053	17.2	10	U 13 31.7	1.82	
11.0	199 38 46.4	5 3 11.7	15 9.1	55 30.76	1.124	17.7	11	L 1 53.9	1.87	
11.5	205 56 42.1	5 0 11.4	15 12.9	55 44.67	1.195	18.2	11	U 14 16.7	1.93	
12.0	212 17 25.3	4 53 28.0	15 17.0	55 59.43	1.266	18.7	12	L 2 40.3	2.00	
12.5	218 41 3.4	-4 43 1.4	15 21.2	56 15.05	+1.338	19.2	12	U 15 4.7	2.07	
13.0	225 7 44.6	4 28 53.9	15 25.7	56 31.53	1.409	19.7	13	L 3 30.1	2.15	
13.5	231 37 38.7	4 11 11.0	15 30.4	56 48.85	1.478	20.2	13	U 15 56.4	2.23	
14.0	238 10 57.0	3 50 0.4	15 35.4	57 6.97	1.541	20.7	14	L 4 23.6	2.30	
14.5	244 47 52.3	3 25 32.9	15 40.5	57 25.80	1.597	21.2	14	U 16 51.5	2.36	
15.0	251 28 37.8	-2 58 2.4	15 45.8	57 45.25	+1.643	21.7	15	L 5 20.2	2.41	
15.5	258 13 26.9	2 27 46.0	15 51.2	58 5.16	1.673	22.2	15	U 17 49.5	2.45	
16.0	265 2 32.4	1 55 4.2	15 56.7	58 25.32	1.692	22.7	16	L 6 19.0	2.47	
16.5	271 56 5.4	1 20 20.5	16 2.2	58 45.44	1.667	23.2	16	U 18 48.7	2.47	
17.0	278 54 14.0	0 44 2.4	16 7.6	59 5.20	1.622	23.7	17	L 7 18.3	2.46	
17.5	285 57 2.1	-0 6 40.7	16 12.8	59 24.23	+1.544	24.2	17	U 19 47.6	2.43	
18.0	293 4 27.8	+0 31 10.3	16 17.6	59 42.09	1.426	24.7	18	L 8 16.4	2.38	
18.5	300 16 22.3	1 8 53.5	16 22.0	59 58.28	1.267	25.2	18	U 20 44.8	2.33	
19.0	307 32 28.4	1 45 49.4	16 25.9	60 12.32	1.067	25.7	19	L 9 12.6	2.29	
19.5	314 52 20.0	2 21 17.2	16 29.0	60 23.72	0.827	26.2	19	U 21 39.8	2.25	
20.0	322 15 21.1	+2 54 35.7	16 31.2	60 32.03	+0.553	26.7	20	L 10 6.5	2.21	
20.5	329 40 46.1	3 25 5.3	16 32.6	60 36.85	+0.248	27.2	20	U 22 32.8	2.18	
21.0	337 7 41.0	3 52 9.0	16 32.8	60 37.88	-0.079	27.7	21	L 10 58.8	2.16	
21.5	344 35 4.9	4 15 14.7	16 32.0	60 34.91	0.416	28.2	21	U 23 24.6	2.14	
22.0	352 1 51.7	4 38 56.0	16 30.1	60 27.91	0.751	28.7		.....	...
22.5	359 26 53.6	+4 47 54.0	16 27.1	60 16.98	-1.070	29.2	22	L 11 50.4	2.14	
23.0	6 49 3.4	4 56 57.5	16 23.2	60 2.32	1.367	0.3	23	U 0 16.1	2.15	
23.5	14 7 18.3	5 1 3.0	16 18.2	59 44.31	1.628	0.8	23	L 12 42.0	2.16	
24.0	21 20 42.0	5 0 15.1	16 12.6	59 23.42	1.848	1.3	24	U 1 8.0	2.18	
24.5	28 28 27.2	4 54 45.0	16 6.2	59 0.16	2.020	1.8	24	L 13 34.4	2.21	
25.0	35 29 57.1	+4 44 49.8	15 59.4	58 35.15	-2.139	2.3	25	U 2 1.0	2.24	
25.5	42 24 46.3	4 30 50.8	15 52.3	58 9.01	2.208	2.8	25	L 14 27.9	2.26	
26.0	49 12 40.9	4 13 12.5	15 45.0	57 42.33	2.231	3.3	26	U 2 55.0	2.27	
26.5	55 53 38.1	3 52 20.7	15 37.7	57 15.67	2.205	3.8	26	L 15 22.3	2.27	
27.0	62 27 45.1	3 28 42.6	15 30.6	56 49.59	2.136	4.3	27	U 3 49.6	2.27	
27.5	68 55 18.1	+3 2 44.5	15 23.8	56 24.54	-2.033	4.8	27	L 16 16.7	2.26	
28.0	75 16 40.8	2 34 52.3	15 17.4	56 0.92	1.899	5.3	28	U 4 43.7	2.23	
28.5	81 32 23.0	2 5 30.5	15 11.4	55 39.07	1.739	5.8	28	L 17 10.3	2.20	
29.0	87 42 59.3	1 35 2.3	15 6.0	55 19.26	1.560	6.3	29	U 5 36.3	2.15	
29.5	93 49 7.5	1 3 49.5	15 1.2	55 1.70	1.365	6.8	29	L 18 1.8	2.10	
30.0	99 51 27.9	+0 32 12.4	14 57.1	54 46.55	-1.160	7.3	30	U 6 26.7	2.04	
30.5	105 50 41.9	+0 0 29.9	14 53.6	54 33.89	0.949	7.8	30	L 18 50.8	1.98	
31.0	111 47 31.5	-0 30 59.8	14 50.9	54 23.78	0.736	8.3	31	U 7 14.3	1.93	
31.5	117 42 38.0	1 1 59.5	14 48.8	54 16.22	0.524	8.8	31	L 19 37.2	1.88	
Apr. 1.0	123 36 41.9	1 32 12.4	14 47.5	54 11.13	0.316	9.3	Apr. 1	U 7 59.4	1.83	
1.5	129 30 22.1	-2 1 22.6	14 46.8	54 8.61	-0.114	9.8	1	L 20 21.1	1.79	
2.0	135 24 15.4	-2 29 13.9	14 46.7	54 8.39	+0.076	10.3	2	U 8 42.4	1.76	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		" ' "	" ' "	" "	" "	" "	d			h m	m
Apr.	1.0	123 36 41.9	-1 32 12.4	14 47.5	54 11.18	-0.316	9.3	Apr. 1	U	7 59.4	1.83
	1.5	129 30 22.1	2 1 22.6	14 46.8	54 8.61	-0.114	9.8	1	L	20 21.1	1.79
	2.0	135 24 15.4	2 29 13.9	14 46.7	54 8.39	+0.076	10.3	2	U	8 42.4	1.76
	2.5	141 18 58.0	2 55 30.6	14 47.2	54 10.39	0.256	10.8	2	L	21 3.3	1.73
	3.0	147 14 55.0	3 19 57.1	14 48.4	54 14.49	0.424	11.3	3	U	9 23.9	1.71
	3.5	153 12 40.5	-3 42 17.7	14 50.0	54 20.51	+0.578	11.8	3	L	21 44.4	1.71
	4.0	159 12 36.9	4 2 17.2	14 52.1	54 28.28	0.715	12.3	4	U	10 4.9	1.71
	4.5	165 15 4.9	4 19 40.5	14 54.7	54 37.60	0.837	12.8	4	L	22 25.5	1.72
	5.0	171 20 21.0	4 34 13.5	14 57.6	54 48.29	0.942	13.3	5	U	10 46.2	1.74
	5.5	177 28 38.1	4 45 42.3	15 0.8	55 0.13	1.030	13.8	5	L	23 7.3	1.77
	6.0	183 40 5.0	-4 53 54.9	15 4.3	55 12.94	+1.101	14.3	6	U	11 28.8	1.82
	6.5	189 54 47.0	4 58 40.4	15 8.0	55 26.50	1.156	14.8	6	L	23 50.9	1.86
	7.0	196 12 46.0	4 59 50.0	15 11.8	55 40.64	1.198	15.3	7	U	12 13.6	1.92
	7.5	202 34 0.6	4 57 17.4	15 15.8	55 55.20	1.226	15.8			.....	...
	8.0	208 58 27.4	4 50 58.7	15 19.9	56 10.01	1.242	16.3	8	L	0 37.1	1.99
	8.5	215 26 1.0	-4 40 53.2	15 23.9	56 24.95	+1.247	16.8	8	U	13 1.4	2.06
	9.0	221 56 35.0	4 27 3.3	15 28.0	56 39.91	1.244	17.3	9	L	1 26.5	2.13
	9.5	228 30 2.8	4 9 34.9	15 32.0	56 54.79	1.236	17.8	9	U	13 52.6	2.21
	10.0	235 6 17.9	3 48 37.4	15 36.1	57 9.54	1.222	18.3	10	L	2 19.6	2.28
	10.5	241 45 14.7	3 24 23.6	15 40.0	57 24.10	1.205	18.8	10	U	14 47.3	2.34
	11.0	248 26 49.3	-2 57 9.7	15 44.0	57 38.43	+1.184	19.3	11	L	3 15.8	2.39
	11.5	255 10 59.0	2 27 15.2	15 47.8	57 52.49	1.159	19.8	11	U	15 44.7	2.43
	12.0	261 57 43.3	1 55 2.5	15 51.5	58 6.23	1.131	20.3	12	L	4 14.0	2.45
	12.5	268 47 2.9	1 20 57.0	15 55.2	58 19.62	1.099	20.8	12	U	16 43.3	2.44
	13.0	275 38 59.8	0 45 26.5	15 58.7	58 32.59	1.062	21.3	13	L	5 12.5	2.42
	13.5	282 33 36.7	-0 9 1.0	16 2.1	58 45.07	+1.015	21.8	13	U	17 41.4	2.39
	14.0	289 30 56.1	+0 27 47.6	16 5.3	58 56.90	0.956	22.3	14	L	6 9.9	2.35
	14.5	296 30 59.3	1 4 25.5	16 8.3	59 7.95	0.885	22.8	14	U	18 37.7	2.30
	15.0	303 33 44.9	1 40 18.5	16 11.1	59 18.06	0.796	23.3	15	L	7 5.0	2.25
	15.5	310 39 8.7	2 14 51.2	16 13.5	59 26.99	0.688	23.8	15	U	19 31.7	2.20
	16.0	317 47 1.9	+2 47 28.6	16 15.6	59 34.50	+0.559	24.3	16	L	7 57.9	2.16
	16.5	324 57 10.1	3 17 36.8	16 17.2	59 40.34	0.410	24.8	16	U	20 23.6	2.13
	17.0	332 9 12.8	3 44 43.2	16 18.2	59 44.26	0.239	25.3	17	L	8 49.0	2.10
	17.5	339 22 43.2	4 8 18.2	16 18.7	59 46.01	+0.048	25.8	17	U	21 14.1	2.09
	18.0	346 37 7.9	4 27 55.9	16 18.5	59 45.35	-0.160	26.3	18	L	9 39.2	2.09
	18.5	353 51 47.6	+4 43 14.9	16 17.7	59 42.13	-0.379	26.8	18	U	22 4.2	2.10
	19.0	1 5 58.3	4 53 59.7	16 16.0	59 36.22	0.606	27.3	19	L	10 29.5	2.11
	19.5	8 18 52.6	5 0 0.6	16 13.7	59 27.59	0.832	27.8	19	U	22 55.0	2.14
	20.0	15 29 41.8	5 1 14.5	16 10.6	59 16.28	1.051	28.3	20	L	11 20.8	2.17
	20.5	22 37 37.8	4 57 45.1	16 6.8	59 2.42	1.255	28.8	20	U	23 47.0	2.20
	21.0	29 41 55.2	+4 49 42.0	16 2.4	58 46.24	-1.438	29.3			.....	...
	21.5	36 41 53.0	4 37 20.4	15 57.5	58 28.01	1.594	0.4	21	L	12 13.6	2.24
	22.0	43 36 56.8	4 21 0.6	15 52.0	58 8.10	1.719	0.9	22	U	0 40.7	2.27
	22.5	50 26 39.7	4 1 6.1	15 46.2	57 46.91	1.807	1.4	22	L	13 8.1	2.29
	23.0	57 10 42.9	3 38 2.9	15 40.2	57 24.87	1.859	1.9	23	U	1 35.7	2.30
	23.5	63 48 56.4	+3 12 18.8	15 34.1	57 2.44	-1.873	2.4	23	L	14 3.4	2.30
	24.0	70 21 18.3	+2 44 21.7	15 28.0	56 40.06	-1.850	2.9	24	U	2 31.0	2.29

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	° ' "	° ' "	' "	' "	"	d			h m	m	
Apr. 24.0	70 21 18.3	+2 44 21.7	15 28.0	56 40.06	-1.850	2.9	Apr. 24	U	2 31.0	2.29	
24.5	76 47 55.2	2 14 39.5	15 22.1	56 18.17	1.792	3.4	24	L	14 58.4	2.27	
25.0	83 9 1.0	1 43 38.7	15 16.4	55 57.17	1.708	3.9	25	U	3 25.4	2.23	
25.5	89 24 55.8	1 11 45.0	15 11.0	55 37.42	1.584	4.4	25	L	15 51.9	2.18	
26.0	95 36 5.8	0 39 22.0	15 6.0	55 19.26	1.439	4.9	26	U	4 17.7	2.12	
26.5	101 43 1.4	+0 6 51.8	15 1.6	55 2.96	-1.274	5.4	26	L	16 42.8	2.06	
27.0	107 46 16.8	-0 25 25.2	14 57.7	54 48.75	1.091	5.9	27	U	5 7.1	2.00	
27.5	113 46 29.0	0 57 10.1	14 54.4	54 36.82	0.894	6.4	27	L	17 30.7	1.94	
28.0	119 44 16.8	1 28 5.3	14 51.9	54 27.33	0.686	6.9	28	U	5 53.6	1.88	
28.5	125 40 20.3	1 57 54.6	14 50.0	54 20.37	0.474	7.4	28	L	18 15.8	1.83	
29.0	131 35 20.3	-2 26 22.2	14 48.8	54 15.99	-0.257	7.9	29	U	6 37.5	1.78	
29.5	137 29 56.9	2 53 13.4	14 48.3	54 14.21	-0.039	8.4	29	L	18 58.6	1.75	
30.0	143 24 50.0	3 18 13.7	14 48.5	54 15.03	+0.174	8.9	30	U	7 19.4	1.72	
30.5	149 20 37.7	3 41 9.1	14 49.4	54 18.37	0.380	9.4	30	L	19 40.0	1.71	
May 1.0	155 17 56.8	4 1 45.4	14 51.0	54 24.13	0.579	9.9	May 1	U	8 0.4	1.70	
1.5	161 17 21.5	-4 19 49.2	14 53.2	54 32.22	+0.766	10.4	1	L	20 20.8	1.70	
2.0	167 19 22.6	4 35 6.9	14 56.0	54 42.45	0.937	10.9	2	U	8 41.4	1.72	
2.5	173 24 28.1	4 47 25.3	14 59.3	54 54.63	1.091	11.4	2	L	21 2.2	1.75	
3.0	179 33 1.7	4 56 32.0	15 3.1	55 8.55	1.226	11.9	3	U	9 23.3	1.78	
3.5	185 45 23.0	5 2 15.1	15 7.3	55 23.95	1.337	12.4	3	L	21 45.0	1.83	
4.0	192 1 46.8	-5 4 24.3	15 11.8	55 40.55	+1.426	12.9	4	U	10 7.3	1.89	
4.5	198 22 23.0	5 2 50.8	15 16.6	55 58.08	1.489	13.4	4	L	22 30.4	1.96	
5.0	204 47 16.4	4 57 28.1	15 21.5	56 16.20	1.527	13.9	5	U	10 54.3	2.03	
5.5	211 16 26.8	4 48 12.4	15 26.6	56 34.62	1.538	14.4	5	L	23 19.1	2.11	
6.0	217 49 49.5	4 35 3.4	15 31.6	56 53.02	1.524	14.9	6	U	11 45.0	2.19	
6.5	224 27 15.1	-4 18 4.0	15 36.5	57 11.09	+1.484	15.4			.....	...
7.0	231 8 30.3	3 57 21.8	15 41.2	57 28.55	1.422	15.9	7	L	0 11.8	2.27	
7.5	237 53 19.1	3 33 8.4	15 45.8	57 45.15	1.341	16.4	7	U	12 39.5	2.35	
8.0	244 41 23.1	3 5 40.0	15 50.0	58 0.66	1.242	16.9	8	L	1 8.1	2.41	
8.5	251 32 22.6	2 35 17.0	15 53.9	58 14.91	1.131	17.4	8	U	13 37.4	2.46	
9.0	258 25 57.0	-2 2 24.1	15 57.4	58 27.76	+1.010	17.9	9	L	2 7.1	2.49	
9.5	265 21 46.9	1 27 29.4	16 0.5	58 39.13	0.884	18.4	9	U	14 36.9	2.49	
10.0	272 19 33.2	0 51 4.0	16 3.2	58 48.98	0.757	18.9	10	L	3 6.8	2.47	
10.5	279 18 58.8	-0 13 41.6	16 5.4	58 57.29	0.628	19.4	10	U	15 36.3	2.44	
11.0	286 19 48.0	+0 24 2.7	16 7.3	59 4.08	0.504	19.9	11	L	4 5.3	2.39	
11.5	293 21 47.0	+1 1 33.0	16 8.7	59 9.42	+0.385	20.4	11	U	16 33.7	2.33	
12.0	300 24 44.0	1 38 13.2	16 9.8	59 13.35	0.271	20.9	12	L	5 1.3	2.27	
12.5	307 28 28.0	2 13 27.9	16 10.5	59 15.95	0.162	21.4	12	U	17 28.2	2.21	
13.0	314 32 49.0	2 46 43.3	16 10.9	59 17.26	+0.056	21.9	13	L	5 54.4	2.16	
13.5	321 37 36.6	3 17 27.1	16 10.9	59 17.32	-0.046	22.4	13	U	18 20.0	2.11	
14.0	328 42 40.4	+3 45 10.0	16 10.6	59 16.16	-0.148	22.9	14	L	6 45.1	2.07	
14.5	335 47 48.4	4 9 25.6	16 9.9	59 13.78	0.249	23.4	14	U	19 9.9	2.05	
15.0	342 52 46.8	4 29 51.2	16 8.9	59 10.19	0.350	23.9	15	L	7 34.3	2.04	
15.5	349 57 19.4	4 46 7.8	16 7.6	59 5.35	0.456	24.4	15	U	19 58.7	2.03	
16.0	357 1 7.8	4 58 1.4	16 6.0	58 59.21	0.565	24.9	16	L	8 23.2	2.04	
16.5	4 3 51.1	+5 5 22.2	16 3.9	58 51.76	-0.677	25.4	16	U	20 47.8	2.06	
17.0	11 5 5.8	+5 8 5.9	16 1.5	58 42.95	-0.792	25.9	17	L	9 12.7	2.09	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" "	" "	" "	" "	" "	d			h m	m	
May 17.0	11 5 5.8	+5 8 5.9	16 1.5	58 42.95	-0.792	25.9	May 17	L	9 12.7	2.09	
17.5	18 4 27.3	5 6 13.0	15 58.8	58 32.76	0.906	26.4	17	U	21 37.9	2.12	
18.0	25 1 29.8	4 59 49.0	15 55.6	58 21.22	1.019	26.9	18	L	10 3.7	2.16	
18.5	31 55 47.1	4 49 4.5	15 52.1	58 8.34	1.126	27.4	18	U	22 29.9	2.20	
19.0	38 46 54.4	4 34 14.4	15 48.2	57 54.21	1.227	27.9	19	L	10 56.5	2.24	
19.5	45 34 28.1	+4 15 37.5	15 44.1	57 38.94	-1.315	28.4	19	U	23 23.6	2.27	
20.0	52 18 8.3	3 53 36.1	15 39.7	57 22.69	1.390	28.9			.....	...
20.5	58 57 37.8	3 28 34.8	15 35.0	57 5.65	1.447	29.4	20	L	11 51.1	2.29	
21.0	65 32 44.4	3 1 0.2	15 30.2	56 48.06	1.482	0.5	21	U	0 18.7	2.30	
21.5	72 3 20.5	2 31 19.5	15 25.4	56 30.19	1.494	1.0	21	L	12 46.3	2.30	
22.0	78 29 23.5	+2 0 0.7	15 20.5	56 12.31	-1.482	1.5	22	U	1 13.7	2.27	
22.5	84 50 56.3	1 27 31.1	15 15.7	55 54.71	1.446	2.0	22	L	13 40.8	2.24	
23.0	91 8 6.7	0 54 16.9	15 11.0	55 37.71	1.384	2.5	23	U	2 7.4	2.19	
23.5	97 21 7.6	+0 20 43.2	15 6.6	55 21.59	1.299	3.0	23	L	14 33.3	2.13	
24.0	103 30 16.3	-0 12 46.4	15 2.6	55 6.63	1.192	3.5	24	U	2 58.5	2.07	
24.5	109 35 54.6	-0 45 49.9	14 58.9	54 53.09	-1.061	4.0	24	L	15 22.9	2.00	
25.0	115 38 27.7	1 18 7.4	14 55.6	54 41.24	0.912	4.5	25	U	3 46.6	1.94	
25.5	121 38 24.4	1 49 20.1	14 52.9	54 31.28	0.745	5.0	25	L	16 9.5	1.88	
26.0	127 36 15.8	2 19 11.1	14 50.8	54 23.44	0.562	5.5	26	U	4 31.7	1.82	
26.5	133 32 35.9	2 47 24.7	14 49.3	54 17.86	0.367	6.0	26	L	16 53.3	1.78	
27.0	139 27 59.8	-3 13 46.3	14 48.4	54 14.67	-0.163	6.5	27	U	5 14.4	1.74	
27.5	145 23 4.2	3 38 2.0	14 48.2	54 13.96	+0.047	7.0	27	L	17 35.2	1.71	
28.0	151 18 26.5	3 59 59.1	14 48.7	54 15.83	0.264	7.5	28	U	5 55.6	1.69	
28.5	157 14 44.2	4 19 24.9	14 50.0	54 20.29	0.480	8.0	28	L	18 15.9	1.69	
29.0	163 12 34.5	4 36 7.3	14 51.9	54 27.32	0.692	8.5	29	U	6 36.1	1.69	
29.5	169 12 34.1	-4 49 54.7	14 54.5	54 36.87	+0.900	9.0	29	L	18 56.5	1.71	
30.0	175 15 17.8	5 0 35.6	14 57.7	54 48.88	1.099	9.5	30	U	7 17.1	1.73	
30.5	181 21 19.0	5 7 59.1	15 1.6	55 3.19	1.285	10.0	30	L	19 38.1	1.77	
31.0	187 31 7.8	5 11 54.9	15 6.1	55 19.64	1.452	10.5	31	U	7 59.7	1.82	
31.5	193 45 11.3	5 12 13.6	15 11.1	55 37.97	1.600	11.0	31	L	20 21.9	1.88	
June 1.0	200 3 52.9	-5 8 46.8	15 16.6	55 57.95	+1.725	11.5	June 1	U	8 44.9	1.95	
1.5	206 27 30.9	5 1 28.1	15 22.4	56 19.24	1.818	12.0	1	L	21 8.8	2.03	
2.0	212 56 18.8	4 56 13.6	15 28.4	56 41.47	1.882	12.5	2	U	9 33.8	2.12	
2.5	219 30 23.8	4 35 1.8	15 34.6	57 4.26	1.910	13.0	2	L	21 59.8	2.21	
3.0	226 9 47.6	4 15 55.2	15 40.9	57 27.16	1.900	13.5	3	U	10 26.9	2.30	
3.5	232 54 25.0	-3 53 0.7	15 47.0	57 49.71	+1.851	14.0	3	L	22 55.0	2.39	
4.0	239 44 5.0	3 26 29.4	15 52.9	58 11.44	1.765	14.5	4	U	11 24.2	2.46	
4.5	246 38 29.8	2 56 38.0	15 58.5	58 31.93	1.643	15.0	4	L	23 54.1	2.52	
5.0	253 37 16.5	2 23 48.2	16 3.6	58 50.72	1.484	15.5	5	U	12 24.5	2.55	
5.5	260 39 57.1	1 48 27.2	16 8.2	59 7.44	1.298	16.0			.....	...
6.0	267 45 59.4	-1 11 6.9	16 12.1	59 21.77	+1.088	16.5	6	L	0 55.1	2.56	
6.5	274 54 48.5	-0 32 23.3	16 15.3	59 33.48	0.862	17.0	6	U	13 25.7	2.54	
7.0	282 5 47.5	+0 7 4.4	16 17.7	59 42.40	0.623	17.5	7	L	1 55.9	2.51	
7.5	289 18 19.2	0 46 35.4	16 19.4	59 48.46	0.387	18.0	7	U	14 25.6	2.45	
8.0	296 31 46.2	1 25 27.6	16 20.3	59 51.70	+0.154	18.5	8	L	2 54.6	2.38	
8.5	303 45 33.2	+2 3 0.1	16 20.4	59 52.20	-0.067	19.0	8	U	15 22.7	2.31	
9.0	310 59 6.9	+2 38 33.9	16 19.8	59 50.17	-0.270	19.5	9	L	3 50.0	2.24	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		" ' "	" ' "	" ' "	" ' "	"	d		L	h m	m
June	9.0	310 59 6.9	+2 38 33.9	16 19.8	59 50.17	-0.270	19.5	June 9	L	3 50.0	2.24
	9.5	318 11 56.6	3 11 32.4	16 18.6	59 45.79	0.435	20.0	9	U	16 16.5	2.18
	10.0	325 23 35.2	3 41 23.6	16 16.9	59 39.35	0.615	20.5	10	L	4 42.2	2.13
	10.5	332 33 38.6	4 7 39.7	16 14.6	59 31.12	0.753	21.0	10	U	17 7.4	2.08
	11.0	339 41 46.1	4 29 57.8	16 12.0	59 21.38	0.868	21.5	11	L	5 32.2	2.05
	11.5	346 47 39.9	+4 48 0.2	16 9.0	59 10.38	-0.961	22.0	11	U	17 56.6	2.03
	12.0	353 51 5.3	5 1 34.3	16 5.7	58 58.38	1.037	22.5	12	L	6 20.9	2.02
	12.5	0 51 49.8	5 10 32.6	16 2.2	58 45.57	1.096	23.0	12	U	18 45.2	2.03
	13.0	7 49 42.8	5 14 52.4	15 58.6	58 32.15	1.140	23.5	13	L	7 9.6	2.04
	13.5	14 44 35.7	5 14 35.8	15 54.8	58 18.26	1.173	24.0	13	U	19 34.2	2.07
	14.0	21 36 21.0	+5 9 48.9	15 50.9	58 4.02	-1.199	24.5	14	L	7 59.2	2.10
	14.5	28 24 52.3	5 0 41.5	15 47.0	57 49.50	1.220	25.0	14	U	20 24.6	2.13
	15.0	35 10 4.5	4 47 27.3	15 43.0	57 34.77	1.236	25.5	15	L	8 50.4	2.17
	15.5	41 51 52.7	4 30 23.1	15 38.9	57 19.87	1.247	26.0	15	U	21 16.7	2.21
	16.0	48 30 13.4	4 9 48.3	15 34.8	57 4.86	1.254	26.5	16	L	9 43.4	2.24
	16.5	55 5 3.5	+3 46 4.5	15 30.7	56 49.80	-1.257	27.0	16	U	22 10.4	2.26
	17.0	61 36 21.4	3 19 35.1	15 26.6	56 34.72	1.257	27.5	17	L	10 37.6	2.27
	17.5	68 4 6.1	2 50 45.1	15 22.5	56 19.66	1.250	28.0	17	U	23 4.8	2.27
	18.0	74 28 18.6	2 20 0.0	15 18.4	56 4.75	1.234	28.5	18	L	11 31.9	2.26
	18.5	80 49 0.9	1 47 46.1	15 14.4	55 50.06	1.211	29.0	18	U	23 56.7	2.22
	19.0	87 6 17.3	+1 14 29.3	15 10.5	55 35.73	-1.176	29.5			.....	....
	19.5	93 20 14.1	0 40 35.2	15 6.7	55 21.88	1.129	0.5	19	L	12 25.0	2.17
	20.0	99 30 59.5	+0 6 28.7	15 3.1	55 8.68	1.099	1.0	20	U	0 50.7	2.11
	20.5	105 38 44.4	-0 27 26.8	14 59.8	54 56.28	0.995	1.5	20	L	13 15.7	2.06
	21.0	111 43 41.8	1 0 48.7	14 56.6	54 44.87	0.905	2.0	21	U	1 40.0	2.00
	21.5	117 46 7.4	-1 33 16.2	14 53.9	54 34.63	-0.799	2.5	21	L	14 3.6	1.93
	22.0	123 46 19.0	2 4 29.9	14 51.4	54 25.76	0.676	3.0	22	U	2 26.4	1.87
	22.5	129 44 37.4	2 34 12.1	14 49.4	54 18.45	0.540	3.5	22	L	14 48.5	1.83
	23.0	135 41 25.5	3 2 6.4	14 47.9	54 12.86	0.398	4.0	23	U	3 10.1	1.77
	23.5	141 37 8.5	3 27 57.9	14 46.9	54 9.18	0.223	4.5	23	L	15 31.1	1.73
	24.0	147 32 13.4	-3 51 33.0	14 46.5	54 7.56	-0.046	5.0	24	U	3 51.7	1.71
	24.5	153 27 9.6	4 12 39.2	14 46.6	54 8.13	+0.144	5.5	24	L	16 12.0	1.69
	25.0	159 22 27.8	4 31 4.8	14 47.4	54 11.03	0.341	6.0	25	U	4 32.2	1.68
	25.5	165 18 40.6	4 46 39.1	14 48.9	54 16.33	0.544	6.5	25	L	16 52.3	1.68
	26.0	171 16 21.1	4 59 12.0	14 51.0	54 24.12	0.755	7.0	26	U	5 12.5	1.69
	26.5	177 16 3.2	-5 8 34.1	14 53.8	54 34.44	+0.906	7.5	26	L	17 32.9	1.71
	27.0	183 18 21.5	5 14 36.5	14 57.3	54 47.27	1.171	8.0	27	U	5 53.6	1.75
	27.5	189 23 50.2	5 17 11.0	15 1.4	55 2.53	1.373	8.5	27	L	18 14.9	1.79
	28.0	195 33 2.4	5 16 10.0	15 6.3	55 20.18	1.566	9.0	28	U	6 36.8	1.85
	28.5	201 46 30.0	5 11 27.2	15 11.7	55 40.05	1.743	9.5	28	L	18 59.4	1.93
	29.0	208 4 43.0	-5 2 57.2	15 17.6	56 1.95	+1.902	10.0	29	U	7 23.0	2.01
	29.5	214 28 8.2	4 50 36.6	15 24.1	56 25.61	2.035	10.5	29	L	19 47.6	2.09
	30.0	220 57 8.4	4 34 24.2	15 30.9	56 50.67	2.138	11.0	30	U	8 13.2	2.18
	30.5	227 32 2.1	4 14 21.7	15 38.0	57 16.78	2.207	11.5	30	L	20 40.1	2.27
July	1.0	234 13 1.9	3 50 34.3	15 45.3	57 43.47	2.234	12.0	July 1	U	9 8.0	2.37
	1.5	241 0 13.6	-3 23 11.4	15 52.6	58 10.21	+2.215	12.5	1	L	21 37.0	2.46
	2.0	247 53 36.3	-2 52 27.7	15 59.7	58 36.44	+2.148	13.0	2	U	10 6.9	2.52

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	" "	" "	" "	" "	" "	d				m
July 1.0	234 13 1.9	-3 50 34.3	15 45.3	57 43.47	+2.234	12.0	July 1	U	9 8.0	2.37
1.5	241 0 13.6	3 23 11.4	15 52.6	58 10.21	2.215	12.5	1	L	21 37.0	2.46
2.0	247 53 36.3	2 52 27.7	15 59.7	58 36.44	2.148	13.0	2	U	10 6.9	2.52
2.5	254 53 0.5	2 18 42.9	16 6.6	59 1.56	2.080	13.5	2	L	22 37.4	2.57
3.0	261 58 8.7	1 42 22.6	16 13.0	59 24.97	1.863	14.0	3	U	11 8.4	2.59
3.5	269 8 34.5	-1 3 58.5	16 18.7	59 46.07	+1.646	14.5	3	L	23 39.4	2.58
4.0	276 23 44.0	-0 24 7.2	16 23.7	60 4.31	1.388	15.0	4	U	12 10.2	2.55
4.5	283 42 55.3	+0 16 29.9	16 27.8	60 19.24	1.064	15.5			.....	....
5.0	291 5 19.9	0 57 8.1	16 30.8	60 30.46	0.773	16.0	5	L	0 40.6	2.50
5.5	298 30 4.6	1 37 0.8	16 32.8	60 37.75	0.440	16.5	5	U	13 10.5	2.44
6.0	305 56 12.9	+2 15 21.6	16 33.7	60 40.99	+0.101	17.0	6	L	1 39.1	2.37
6.5	313 22 46.9	2 51 25.9	16 33.5	60 40.20	-0.229	17.5	6	U	14 7.2	2.30
7.0	320 48 49.2	3 24 32.6	16 32.2	60 35.56	0.589	18.0	7	L	2 34.5	2.24
7.5	328 13 25.2	3 54 5.8	16 30.0	60 27.38	0.820	18.5	7	U	15 1.0	2.18
8.0	335 35 44.5	4 19 35.9	16 26.9	60 16.02	1.068	19.0	8	L	3 26.9	2.13
8.5	342 55 2.7	+4 40 40.0	16 23.1	60 1.92	-1.275	19.5	8	U	15 52.3	2.10
9.0	350 10 41.8	4 57 2.4	16 18.6	59 45.59	1.442	20.0	9	L	4 17.3	2.08
9.5	357 22 11.3	5 8 34.4	16 13.7	59 27.49	1.568	20.5	9	U	16 42.2	2.06
10.0	4 29 8.3	5 15 13.6	16 8.4	59 8.12	1.654	21.0	10	L	5 6.9	2.06
10.5	11 31 17.0	5 17 3.1	16 2.9	58 47.95	1.705	21.5	10	U	17 31.7	2.07
11.0	18 28 28.5	+5 14 11.5	15 57.3	58 27.33	-1.726	22.0	11	L	5 56.7	2.09
11.5	25 20 40.0	5 6 51.0	15 51.6	58 6.64	1.720	22.5	11	U	18 21.9	2.11
12.0	32 7 53.5	4 55 17.3	15 46.1	57 46.15	1.692	23.0	12	L	6 47.5	2.14
12.5	38 50 15.6	4 39 48.6	15 40.6	57 26.10	1.647	23.5	12	U	19 13.4	2.17
13.0	45 27 56.4	4 20 45.3	15 35.3	57 6.67	1.561	24.0	13	L	7 39.6	2.20
13.5	52 1 7.9	+3 58 29.2	15 30.2	56 47.97	-1.524	24.5	13	U	20 6.1	2.22
14.0	58 30 4.3	3 33 23.1	15 25.3	56 30.11	1.454	25.0	14	L	8 32.9	2.24
14.5	64 55 0.8	3 5 50.5	15 20.7	56 13.11	1.379	25.5	14	U	20 59.7	2.24
15.0	71 16 12.8	2 36 15.6	15 16.3	55 57.02	1.303	26.0	15	L	9 26.6	2.23
15.5	77 33 56.1	2 5 2.6	15 12.2	55 41.85	1.226	26.5	15	U	21 53.2	2.21
16.0	83 48 26.2	+1 32 35.5	15 8.3	55 27.59	-1.150	27.0	16	L	10 19.5	2.18
16.5	89 59 58.0	0 59 18.5	15 4.6	55 14.26	1.071	27.5	16	U	22 45.4	2.13
17.0	96 8 46.2	+0 25 35.3	15 1.3	55 1.88	0.993	28.0	17	L	11 10.6	2.08
17.5	102 15 5.1	-0 8 11.3	14 58.2	54 50.43	0.913	28.5	17	U	23 35.3	2.02
18.0	108 19 8.4	0 41 38.8	14 55.3	54 39.99	0.829	29.0			.....	....
18.5	114 21 9.8	-1 14 26.1	14 52.7	54 30.56	-0.742	29.5	18	L	11 59.2	1.97
19.0	120 21 23.1	1 46 12.6	14 50.5	54 22.20	0.649	0.4	19	U	0 22.5	1.91
19.5	126 20 2.5	2 16 39.4	14 48.5	54 15.00	0.549	0.9	19	L	12 45.1	1.85
20.0	132 17 22.5	2 45 28.6	14 46.9	54 9.05	0.441	1.4	20	U	1 7.0	1.80
20.5	138 13 38.5	3 12 23.8	14 45.6	54 4.44	0.325	1.9	20	L	13 28.4	1.76
21.0	144 9 6.8	-3 37 9.7	14 44.8	54 1.29	-0.199	2.4	21	U	1 49.3	1.73
21.5	150 4 5.1	3 59 32.7	14 44.3	53 59.71	-0.063	2.9	21	L	14 9.8	1.70
22.0	155 58 52.5	4 19 20.5	14 44.4	53 59.83	+0.084	3.4	22	U	2 30.1	1.68
22.5	161 53 49.6	4 36 21.8	14 44.9	54 1.78	0.243	3.9	22	L	14 50.2	1.67
23.0	167 49 19.0	4 50 26.8	14 46.0	54 5.70	0.411	4.4	23	U	3 10.2	1.67
23.5	173 45 44.6	-5 1 26.4	14 47.6	54 11.67	+0.587	4.9	23	L	15 30.3	1.68
24.0	179 43 32.4	-5 9 13.3	14 49.8	54 19.81	+0.771	5.4	24	U	3 50.6	1.70

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
July	24.0	179 43 32.4	-5 9 13.3	14 49.8	54 19.81	+0.771	5.4	July 24	U	3 50.6	1.70
	24.5	185 43 10.0	5 13 40.6	14 52.6	54 30.20	0.961	5.9	24	L	16 11.2	1.73
	25.0	191 45 6.4	5 14 42.2	14 56.1	54 42.89	1.155	6.4	25	U	4 32.2	1.78
	25.5	197 49 52.0	5 12 13.3	15 0.2	54 57.92	1.351	6.9	25	L	16 53.8	1.83
	26.0	203 57 57.8	5 6 10.3	15 4.9	55 15.28	1.542	7.4	26	U	5 16.2	1.89
	26.5	210 9 55.9	-4 56 30.5	15 10.3	55 34.91	+1.728	7.9	26	L	17 39.3	1.96
	27.0	216 26 17.6	4 43 12.6	15 16.2	55 56.71	1.903	8.4	27	U	6 3.4	2.06
	27.5	222 47 33.9	4 26 17.3	15 22.7	56 20.52	2.062	8.9	27	L	18 28.5	2.14
	28.0	229 14 13.9	4 5 47.2	15 29.7	56 46.10	2.198	9.4	28	U	6 54.7	2.23
	28.5	235 46 44.4	3 41 47.9	15 37.1	57 13.15	2.306	9.9	28	L	19 21.9	2.31
	29.0	242 25 28.4	-3 14 28.0	15 44.7	57 41.30	+2.379	10.4	29	U	7 50.2	2.40
	29.5	249 10 44.2	2 44 0.3	15 52.6	58 10.07	2.408	10.9	29	L	20 19.4	2.47
	30.0	256 2 43.6	2 10 41.8	16 0.4	58 38.91	2.391	11.4	30	U	8 49.4	2.52
	30.5	263 1 30.8	1 34 54.9	16 8.1	59 7.23	2.320	11.9	30	L	21 19.8	2.55
	31.0	270 7 1.8	0 57 7.3	16 15.5	59 34.36	2.191	12.4	31	U	9 50.5	2.56
	31.5	277 19 1.8	-0 17 52.3	16 22.4	59 59.58	+2.002	12.9	31	L	22 21.2	2.55
Aug.	1.0	284 37 5.7	+0 22 11.6	16 28.6	60 22.19	1.758	13.4	Aug. 1	U	10 51.6	2.52
	1.5	292 0 37.1	0 2 21.2	16 33.8	60 41.55	1.460	13.9	1	L	23 21.5	2.47
	2.0	299 28 48.5	1 41 49.9	16 38.1	60 57.04	1.116	14.4	2	U	11 50.8	2.41
	2.5	307 0 42.6	2 19 49.7	16 41.1	61 8.18	0.735	14.9			.....	...
	3.0	314 35 13.5	+2 55 32.9	16 42.9	61 14.62	+0.336	15.4	3	L	0 19.5	2.36
	3.5	322 11 8.7	3 28 14.2	16 43.3	61 16.21	-0.071	15.9	3	U	12 47.4	2.30
	4.0	329 47 12.7	3 57 13.2	16 42.4	61 12.94	0.472	16.4	4	L	1 14.7	2.25
	4.5	337 22 9.4	4 21 55.8	16 40.2	61 4.98	0.849	16.9	4	U	13 41.5	2.21
	5.0	344 54 45.4	4 41 56.0	16 36.9	60 52.72	1.189	17.4	5	L	2 7.8	2.18
	5.5	352 23 53.6	+4 56 56.2	16 32.5	60 36.62	-1.486	17.9	5	U	14 33.8	2.15
	6.0	359 48 34.8	5 6 47.8	16 27.2	60 17.26	1.732	18.4	6	L	2 59.5	2.14
	6.5	7 8 0.1	5 11 30.3	16 21.2	59 55.27	1.922	18.9	6	U	15 25.2	2.14
	7.0	14 21 32.1	5 11 10.4	16 14.7	59 31.34	2.058	19.4	7	L	3 50.9	2.15
	7.5	21 28 44.8	5 6 1.2	16 7.8	59 6.06	2.145	19.9	7	U	16 16.8	2.16
	8.0	28 29 23.3	+4 56 20.4	16 0.7	58 40.06	-2.181	20.4	8	L	4 42.8	2.18
	8.5	35 23 23.2	4 42 29.2	15 53.6	58 13.89	2.174	20.9	8	U	17 9.0	2.20
	9.0	42 10 49.4	4 24 51.3	15 46.6	57 48.03	2.132	21.4	9	L	5 35.5	2.22
	9.5	48 51 54.0	4 3 51.8	15 39.7	57 22.85	2.061	21.9	9	U	18 2.2	2.23
	10.0	55 26 55.3	3 39 56.3	15 33.1	56 58.66	1.966	22.4	10	L	6 29.1	2.24
	10.5	61 56 16.3	+3 13 30.3	15 26.9	56 35.74	-1.853	22.9	10	U	18 56.0	2.24
	11.0	68 20 23.2	2 44 59.1	15 21.0	56 14.24	1.729	23.4	11	L	7 22.9	2.23
	11.5	74 39 43.9	2 14 47.4	15 15.6	55 54.28	1.596	23.9	11	U	19 49.6	2.21
	12.0	80 54 47.7	1 43 19.3	15 10.6	55 35.95	1.459	24.4	12	L	8 16.0	2.18
	12.5	87 6 3.6	1 10 58.0	15 6.0	55 19.27	1.322	24.9	12	U	20 41.9	2.14
	13.0	93 14 0.0	+0 38 5.8	15 1.9	55 4.23	-1.187	25.4	13	L	9 7.4	2.10
	13.5	99 19 4.4	+0 5 4.4	14 58.2	54 50.78	1.063	25.9	13	U	21 32.3	2.04
	14.0	105 21 42.5	-0 27 45.4	14 55.0	54 38.94	0.922	26.4	14	L	9 56.5	1.99
	14.5	111 22 18.1	1 0 3.4	14 52.2	54 28.62	0.798	26.9	14	U	22 20.0	1.93
	15.0	117 21 13.2	1 31 30.2	14 49.8	54 19.77	0.678	27.4	15	L	10 42.9	1.88
	15.5	123 18 48.0	-2 1 47.2	14 47.8	54 12.33	-0.562	27.9	15	U	23 5.2	1.83
	16.0	129 15 20.7	-2 30 36.8	14 46.1	54 6.27	-0.449	28.4	16	L	11 26.9	1.79

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	" ' "	" ' "	" "	" "	" "	d		h m	m	
Aug. 16.0	129 15 20.7	-2 30 36.8	14 46.1	54 6.27	-0.449	28.4	Aug. 16	L 11 26.9	1.79	
16.5	135 11 7.8	2 57 42.4	14 44.8	54 1.55	0.338	28.9	16	U 23 48.1	1.75	
17.0	141 6 24.7	3 22 47.9	14 43.9	53 58.15	0.227	29.4		.....	...
17.5	147 1 25.4	3 45 39.1	14 43.4	53 56.11	0.115	0.2	17	L 12 8.9	1.72	
18.0	152 56 23.4	4 6 2.5	14 43.2	53 55.38	-0.004	0.7	18	U 0 29.3	1.69	
18.5	158 51 31.8	-4 23 45.9	14 43.3	53 56.02	+0.112	1.2	18	L 12 49.5	1.68	
19.0	164 47 3.6	4 38 38.7	14 43.9	53 58.10	0.234	1.7	19	U 1 9.6	1.67	
19.5	170 43 12.4	4 50 31.5	14 44.9	54 1.65	0.369	2.2	19	L 13 29.7	1.67	
20.0	176 40 12.4	4 59 16.3	14 46.2	54 6.75	0.492	2.7	20	U 1 49.9	1.68	
20.5	182 38 19.0	5 4 46.7	14 48.1	54 13.48	0.631	3.2	20	L 14 10.2	1.71	
21.0	188 37 49.3	-5 6 57.5	14 50.4	54 21.92	+0.777	3.7	21	U 2 30.9	1.74	
21.5	194 39 1.8	5 5 45.1	14 53.2	54 32.15	0.929	4.2	21	L 14 52.0	1.78	
22.0	200 42 17.0	5 1 7.3	14 56.5	54 44.25	1.087	4.7	22	U 3 13.6	1.83	
22.5	206 47 57.4	4 53 3.1	15 0.3	54 58.27	1.249	5.2	22	L 15 35.9	1.89	
23.0	212 56 27.4	4 41 33.2	15 4.6	55 14.25	1.415	5.7	23	U 3 58.9	1.95	
23.5	219 8 13.2	-4 26 39.7	15 9.5	55 32.22	+1.580	6.2	23	L 16 22.7	2.02	
24.0	225 23 42.3	4 8 26.5	15 15.0	55 52.15	1.740	6.7	24	U 4 47.4	2.10	
24.5	231 43 23.4	3 46 59.3	15 20.9	56 13.96	1.893	7.2	24	L 17 13.1	2.18	
25.0	238 7 45.6	3 22 26.0	15 27.4	56 37.54	2.034	7.7	25	U 5 39.7	2.26	
25.5	244 37 17.9	2 54 57.1	15 34.2	57 2.70	2.167	8.2	25	L 18 7.2	2.32	
26.0	251 12 27.6	-2 24 45.8	15 41.4	57 29.20	+2.255	8.7	26	U 6 35.5	2.38	
26.5	257 53 39.9	1 52 8.8	15 48.9	57 56.71	2.322	9.2	26	L 19 4.5	2.43	
27.0	264 41 16.0	1 17 26.7	15 56.6	58 24.79	2.351	9.7	27	U 7 33.9	2.46	
27.5	271 35 32.0	0 41 4.1	16 4.3	58 52.96	2.335	10.2	27	L 20 3.6	2.48	
28.0	278 36 36.6	-0 3 30.1	16 11.8	59 20.64	2.269	10.7	28	U 8 33.3	2.48	
28.5	285 44 29.9	+0 34 41.6	16 19.0	59 47.19	+2.146	11.2	28	L 21 2.9	2.46	
29.0	292 59 1.7	1 12 53.0	16 25.8	60 11.91	1.965	11.7	29	U 9 32.3	2.43	
29.5	300 19 49.7	1 50 22.6	16 31.8	60 34.10	1.724	12.2	29	L 22 1.2	2.39	
30.0	307 46 19.1	2 26 26.0	16 37.0	60 53.06	1.426	12.7	30	U 10 29.6	2.35	
30.5	315 17 42.2	3 0 17.9	16 41.1	61 8.14	1.078	13.2	30	L 22 57.6	2.31	
31.0	322 52 58.9	+3 31 13.9	16 44.0	61 18.79	+0.691	13.7	31	U 11 25.1	2.27	
31.5	330 30 58.1	3 58 32.5	16 45.6	61 24.63	+0.278	14.2	31	L 23 52.2	2.24	
Sept. 1.0	338 10 20.6	4 21 37.2	16 45.8	61 25.42	-0.149	14.7	Sept. 1	U 12 19.0	2.22	
1.5	345 49 41.8	4 39 58.5	16 44.6	61 21.09	0.571	15.2		.....	...
2.0	353 27 36.2	4 53 15.5	16 42.1	61 11.79	0.974	15.7	2	L 0 45.6	2.21	
2.5	1 2 40.9	+5 1 16.6	16 38.3	60 57.85	-1.342	16.2	2	U 13 12.2	2.21	
3.0	8 33 39.7	5 3 59.8	16 33.4	60 39.77	1.663	16.7	3	L 1 38.7	2.22	
3.5	15 59 25.9	5 1 31.6	16 27.5	60 18.15	1.931	17.2	3	U 14 5.4	2.23	
4.0	23 19 5.1	4 54 6.5	16 20.8	59 53.66	2.140	17.7	4	L 2 32.2	2.24	
4.5	30 31 56.3	4 42 5.2	16 13.5	59 27.02	2.289	18.2	4	U 14 59.2	2.26	
5.0	37 37 32.7	+4 25 52.9	16 5.9	58 58.97	-2.377	18.7	5	L 3 26.5	2.28	
5.5	44 35 40.5	4 5 57.9	15 58.0	58 30.19	2.410	19.2	5	U 15 53.9	2.29	
6.0	51 26 18.4	3 42 49.8	15 50.2	58 1.32	2.394	19.7	6	L 4 21.5	2.30	
6.5	58 9 35.9	3 16 58.8	15 42.4	57 32.90	2.336	20.2	6	U 16 49.1	2.30	
7.0	64 45 51.2	2 48 54.4	15 35.0	57 5.41	2.242	20.7	7	L 5 16.7	2.29	
7.5	71 15 29.9	+2 19 4.9	15 27.8	56 39.22	-2.119	21.2	7	U 17 44.0	2.27	
8.0	77 39 2.4	+1 47 57.3	15 21.1	56 14.64	-1.974	21.7	8	L 6 11.0	2.23	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	" " "	" " "	" "	" "	"	d	Sept.	L	h m	m	
Sept. 8.0	77 39 2.4	+1 47 57.3	15 21.1	56 14.64	-1.974	21.7	Sept. 8	L	6 11.0	2.23	
8.5	83 57 3.1	1 15 56.8	15 14.9	55 51.91	1.813	22.2	8	U	18 37.6	2.19	
9.0	90 10 8.4	0 43 27.1	15 9.3	55 31.18	1.641	22.7	9	L	7 3.6	2.14	
9.5	96 18 55.7	+0 10 49.9	15 4.2	55 12.55	1.463	23.2	9	U	19 28.9	2.08	
10.0	102 24 2.4	-0 21 34.2	14 59.7	54 56.07	1.283	23.7	10	L	7 53.6	2.02	
10.5	108 26 5.1	-0 53 25.7	14 55.8	54 41.75	-1.108	24.2	10	U	20 17.5	1.96	
11.0	114 25 38.9	1 24 26.6	14 52.5	54 29.57	0.928	24.7	11	L	8 40.8	1.91	
11.5	120 23 16.8	1 54 19.6	14 49.7	54 19.46	0.760	25.2	11	U	21 3.4	1.86	
12.0	126 19 29.3	2 22 48.4	14 47.5	54 11.33	0.597	25.7	12	L	9 25.4	1.81	
12.5	132 14 44.4	2 49 37.4	14 45.8	54 5.10	0.443	26.2	12	U	21 46.9	1.77	
13.0	138 9 27.3	-3 14 31.6	14 44.6	54 0.68	-0.297	26.7	13	L	10 7.9	1.74	
13.5	144 4 0.3	3 37 17.1	14 43.9	53 57.96	0.159	27.2	13	U	22 28.6	1.71	
14.0	149 58 43.1	3 57 40.5	14 43.6	53 56.84	-0.080	27.7	14	L	10 49.0	1.69	
14.5	155 53 52.5	4 15 29.5	14 43.7	53 57.21	+0.091	28.2	14	U	23 9.2	1.68	
15.0	161 49 43.1	4 30 33.0	14 44.2	53 59.00	0.206	28.7	15	L	11 29.4	1.63	
15.5	167 46 27.6	-4 42 40.7	14 45.0	54 2.13	+0.316	29.2	15	U	23 49.6	1.60	
16.0	173 44 16.7	4 51 44.1	14 46.2	54 6.55	0.421	0.1			.....	...
16.5	179 43 20.1	4 57 35.8	14 47.8	54 12.22	0.523	0.6	16	L	12 9.9	1.70	
17.0	185 43 46.7	5 0 10.3	14 49.6	54 19.11	0.625	1.1	17	U	0 30.5	1.73	
17.5	191 45 45.0	4 59 23.6	14 51.8	54 27.22	0.726	1.6	17	L	12 51.5	1.76	
18.0	197 49 23.7	-4 55 13.6	14 54.4	54 36.54	+0.828	2.1	18	U	1 12.9	1.80	
18.5	203 54 52.6	4 47 40.0	14 57.2	54 47.10	0.933	2.6	18	L	13 34.8	1.86	
19.0	210 2 22.4	4 36 44.8	15 0.5	54 58.93	1.039	3.1	19	U	1 57.4	1.91	
19.5	216 12 5.3	4 22 31.5	15 4.0	55 12.06	1.150	3.6	19	L	14 20.7	1.97	
20.0	222 24 15.7	4 5 5.7	15 8.0	55 26.53	1.263	4.1	20	U	2 44.7	2.04	
20.5	228 39 9.7	-3 44 35.2	15 12.3	55 42.36	+1.376	4.6	20	L	15 9.6	2.10	
21.0	234 57 5.9	3 21 9.6	15 17.0	55 59.55	1.489	5.1	21	U	3 35.2	2.17	
21.5	241 18 24.8	2 55 0.8	15 22.0	56 18.10	1.603	5.6	21	L	16 1.6	2.23	
22.0	247 43 28.5	2 26 22.8	15 27.5	56 37.99	1.711	6.1	22	U	4 28.7	2.29	
22.5	254 12 40.4	1 55 32.0	15 33.2	56 59.12	1.809	6.6	22	L	16 56.5	2.33	
23.0	260 46 24.2	-1 22 47.3	15 39.3	57 21.35	+1.894	7.1	23	U	5 24.6	2.36	
23.5	267 25 3.7	0 48 30.3	15 45.6	57 44.51	1.993	7.6	23	L	17 53.1	2.38	
24.0	274 9 1.1	-0 13 5.5	15 52.1	58 8.35	2.096	8.1	24	U	6 21.7	2.38	
24.5	280 58 35.7	+0 22 59.8	15 58.7	58 32.54	2.021	8.6	24	L	18 50.3	2.38	
25.0	287 54 2.4	0 59 14.9	16 5.2	58 56.70	1.999	9.1	25	U	7 18.7	2.36	
25.5	294 55 30.1	+1 35 6.5	16 11.7	59 20.35	+1.936	9.6	25	L	19 46.9	2.33	
26.0	302 3 0.1	2 9 58.6	16 17.9	59 42.97	1.826	10.1	26	U	8 14.7	2.30	
26.5	309 16 23.9	2 43 13.1	16 23.6	60 3.98	1.667	10.6	26	L	20 42.2	2.27	
27.0	316 35 22.3	3 14 10.8	16 28.7	60 22.78	1.458	11.1	27	U	9 9.3	2.25	
27.5	323 59 24.1	3 42 12.7	16 33.1	60 38.77	1.200	11.6	27	L	21 36.1	2.23	
28.0	331 27 45.9	+4 6 41.6	16 36.5	60 51.39	+0.896	12.1	28	U	10 2.8	2.21	
28.5	338 59 32.1	4 27 3.6	16 38.9	61 0.12	0.554	12.6	28	L	22 29.3	2.21	
29.0	346 33 36.6	4 42 50.0	16 40.1	61 4.56	+0.183	13.1	29	U	10 55.8	2.21	
29.5	354 8 45.0	4 53 39.1	16 40.1	61 4.46	-0.202	13.6	29	L	23 22.4	2.22	
30.0	1 43 37.7	4 59 17.0	16 38.8	60 59.72	0.588	14.1	30	U	11 49.2	2.24	
30.5	9 16 53.6	+4 59 39.1	16 36.3	60 50.40	-0.961	14.6			.....	...
Oct. 1.0	16 47 13.7	+4 54 49.6	16 32.5	60 36.75	-1.309	15.1	Oct. 1	L	0 16.2	2.27	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		" ' "	" ' "	" "	" "	"	d					
								Oct.		L	h m	m
Oct.	1.0	16 47 13.7	+4 54 49.6	16 32.5	60 36.75	-1.309	15.1	1	L	0 16.2	2.27	
	1.5	24 13 25.1	4 45 1.1	16 27.7	60 19.14	1.619	15.6	1	U	12 43.6	2.29	
	2.0	31 34 23.9	4 30 33.9	16 22.0	59 58.09	1.881	16.1	2	L	1 11.3	2.32	
	2.5	38 49 17.7	4 11 54.1	16 15.5	59 34.21	2.089	16.6	2	U	13 39.3	2.35	
	3.0	45 57 26.9	3 49 32.0	16 8.4	59 8.16	2.243	17.1	3	L	2 7.6	2.37	
	3.5	52 58 25.4	+3 24 0.3	16 0.9	58 40.63	-2.337	17.6	3	U	14 36.1	2.38	
	4.0	59 52 0.2	2 55 52.9	15 53.2	58 12.30	2.376	18.1	4	L	3 4.6	2.37	
	4.5	66 38 10.3	2 25 43.3	15 45.4	57 43.80	2.366	18.6	4	U	15 33.0	2.36	
	5.0	73 17 5.4	1 54 3.7	15 37.7	57 15.70	2.311	19.1	5	L	4 1.1	2.33	
	5.5	79 49 4.5	1 21 24.2	15 30.3	56 48.51	2.214	19.6	5	U	16 28.8	2.28	
	6.0	86 14 33.7	+0 48 12.8	15 23.3	56 22.68	-2.086	20.1	6	L	4 55.9	2.23	
	6.5	92 34 4.8	+0 14 54.9	15 16.7	55 58.54	1.932	20.6	6	U	17 22.2	2.17	
	7.0	98 48 13.8	-0 18 6.5	15 10.7	55 36.38	1.758	21.1	7	L	5 47.8	2.10	
	7.5	104 57 39.3	0 50 30.5	15 5.2	55 16.41	1.569	21.6	7	U	18 12.7	2.03	
	8.0	111 3 1.2	1 21 58.2	15 0.4	54 58.78	1.370	22.1	8	L	6 36.7	1.97	
	8.5	117 5 0.0	-1 52 12.6	14 56.3	54 43.56	-1.165	22.6	8	U	18 59.9	1.91	
	9.0	123 4 15.9	2 20 58.0	14 52.8	54 30.81	0.980	23.1	9	L	7 22.4	1.85	
	9.5	129 1 28.0	2 47 59.8	14 50.0	54 20.52	0.755	23.6	9	U	19 44.3	1.80	
	10.0	134 57 13.3	3 13 4.4	14 47.9	54 12.66	0.556	24.1	10	L	8 5.7	1.76	
	10.5	140 52 6.8	3 35 59.2	14 46.4	54 7.15	0.363	24.6	10	U	20 26.6	1.73	
	11.0	146 46 41.2	-3 56 32.1	14 45.5	54 3.90	-0.180	25.1	11	L	8 47.2	1.70	
	11.5	152 41 26.0	4 14 31.8	14 45.2	54 2.78	-0.008	25.6	11	U	21 7.5	1.69	
	12.0	158 36 47.7	4 29 47.5	14 45.4	54 3.65	+0.152	26.1	12	L	9 27.8	1.68	
	12.5	164 38 9.4	4 42 9.5	14 46.2	54 6.38	0.301	26.6	12	U	21 48.0	1.69	
	13.0	170 30 51.4	4 51 28.7	14 47.4	54 10.82	0.435	27.1	13	L	10 8.3	1.70	
	13.5	176 30 10.0	-4 57 37.2	14 49.0	54 16.78	+0.556	27.6	13	U	22 28.9	1.72	
	14.0	182 31 19.0	5 0 28.6	14 51.0	54 24.13	0.666	28.1	14	L	10 49.7	1.75	
	14.5	188 34 29.2	4 59 57.9	14 53.3	54 32.71	0.762	28.6	14	U	23 11.0	1.79	
	15.0	194 39 48.8	4 56 1.7	14 56.0	54 42.38	0.848	29.1	15	L	11 32.8	1.84	
	15.5	200 47 23.7	4 48 38.9	14 58.9	54 53.02	0.922	29.6	15	U	23 55.3	1.90	
	16.0	206 57 18.2	-4 37 50.4	15 2.0	55 4.48	+0.988	0.4			.....	...
	16.5	213 9 36.0	4 23 39.5	15 5.3	55 16.71	1.047	0.9	16	L	12 18.4	1.96	
	17.0	219 24 19.8	4 6 12.2	15 8.8	55 29.58	1.099	1.4	17	U	0 42.2	2.02	
	17.5	225 41 32.1	3 45 37.0	15 12.5	55 43.05	1.147	1.9	17	L	13 6.9	2.08	
	18.0	232 1 16.3	3 22 4.9	15 16.3	55 57.08	1.191	2.4	18	U	1 32.3	2.15	
	18.5	238 23 36.7	-2 55 49.5	15 20.3	56 11.64	+1.234	2.9	18	L	13 58.4	2.21	
	19.0	244 48 39.2	2 27 6.9	15 24.4	56 26.70	1.275	3.4	19	U	2 25.2	2.26	
	19.5	251 16 31.2	1 56 15.8	15 28.6	56 42.24	1.314	3.9	19	L	14 52.5	2.30	
	20.0	257 47 22.1	1 23 37.0	15 33.0	56 58.23	1.351	4.4	20	U	3 20.3	2.33	
	20.5	264 21 22.6	0 49 33.6	15 37.5	57 14.66	1.387	4.9	20	L	15 48.4	2.34	
	21.0	270 58 45.2	-0 14 30.7	15 42.0	57 31.49	+1.417	5.4	21	U	4 16.5	2.34	
	21.5	277 39 43.2	+0 21 4.7	15 46.7	57 48.65	1.440	5.9	21	L	16 44.5	2.33	
	22.0	284 24 29.8	0 56 43.9	15 51.5	58 6.01	1.452	6.4	22	U	5 12.4	2.31	
	22.5	291 13 17.7	1 31 56.6	15 56.2	58 23.45	1.452	6.9	22	L	17 39.9	2.28	
	23.0	298 6 17.9	2 6 11.2	16 0.9	58 40.78	1.433	7.4	23	U	6 7.0	2.25	
	23.5	305 3 37.5	+2 38 55.2	16 5.6	58 57.74	+1.391	7.9	23	L	18 33.7	2.21	
	24.0	312 5 19.6	+3 9 35.3	16 10.0	59 14.06	+1.324	8.4	24	U	7 0.1	2.18	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	" ' "	" ' "	" "	" "	" "	d			h m	m
Oct. 24.0	312 5 19.6	+3 9 35.3	16 10.0	59 14.06	+1.324	8.4	Oct. 24	U	7 0.1	2.18
24.5	319 11 21.9	3 37 38.6	16 14.2	59 29.40	1.227	8.9	24	L	19 26.1	2.16
25.0	326 21 34.6	4 2 32.9	16 18.0	59 43.39	1.088	9.4	25	U	7 51.9	2.14
25.5	333 35 39.6	4 23 47.7	16 21.3	59 55.61	0.934	9.9	25	L	20 17.6	2.13
26.0	340 53 10.1	4 40 55.7	16 24.1	60 5.67	0.735	10.4	26	U	8 43.2	2.13
26.5	348 13 30.4	+4 53 33.4	16 26.1	60 13.14	+0.504	10.9	26	L	21 8.9	2.15
27.0	355 35 56.0	5 1 22.4	16 27.3	60 17.67	+0.248	11.4	27	U	9 34.7	2.17
27.5	2 59 34.4	5 4 11.1	16 27.7	60 18.99	-0.031	11.9	27	L	22 1.0	2.20
28.0	10 23 27.9	5 1 54.6	16 27.1	60 16.86	0.825	12.4	28	U	10 27.6	2.24
28.5	17 46 34.5	4 54 35.9	16 25.6	60 11.16	0.626	12.9	28	L	22 54.6	2.28
29.0	25 7 51.0	+4 42 25.3	16 23.0	60 1.87	-0.919	13.4	29	U	11 22.3	2.32
29.5	32 26 16.2	4 25 40.5	16 19.6	59 49.18	1.194	13.9	29	L	23 50.4	2.36
30.0	39 40 53.3	4 4 45.4	16 15.2	59 33.30	1.447	14.4	30	U	12 18.9	2.39
30.5	46 50 51.5	3 40 9.1	16 10.1	59 14.57	1.667	14.9			.....	...
31.0	53 55 28.8	3 12 24.2	16 4.4	58 53.44	1.847	15.4	31	L	0 47.7	2.41
31.5	60 54 12.9	+2 42 5.6	15 58.1	58 30.42	-1.963	15.9	31	U	13 16.8	2.42
Nov. 1.0	67 46 41.8	2 9 48.6	15 51.5	58 6.05	2.072	16.4	Nov. 1	L	1 45.7	2.41
1.5	74 32 43.5	1 36 8.0	15 44.6	57 40.89	2.116	16.9	1	U	14 14.5	2.38
2.0	81 12 16.1	1 1 37.3	15 37.7	57 15.46	2.114	17.4	2	L	2 42.8	2.33
2.5	87 45 26.4	+0 26 47.5	15 30.8	56 50.33	2.069	17.9	2	U	15 10.5	2.27
3.0	94 12 29.4	-0 7 52.9	15 24.2	56 25.95	-1.968	18.4	3	L	3 37.4	2.21
3.5	100 33 47.0	0 41 58.6	15 17.9	56 2.77	1.872	18.9	3	U	16 3.5	2.14
4.0	106 49 46.5	1 15 6.9	15 12.0	55 41.14	1.728	19.4	4	L	4 28.7	2.06
4.5	113 0 59.3	1 46 57.7	15 6.6	55 21.39	1.561	19.9	4	U	16 53.0	1.99
5.0	119 8 0.5	2 17 13.6	15 1.8	55 3.75	1.376	20.4	5	L	5 16.4	1.92
5.5	125 11 27.5	-2 45 39.1	14 57.6	54 48.44	-1.175	20.9	5	U	17 39.1	1.86
6.0	131 11 58.7	3 12 0.8	14 54.1	54 35.60	0.963	21.4	6	L	6 1.1	1.81
6.5	137 10 13.5	3 36 6.3	14 51.3	54 25.34	0.747	21.9	6	U	18 22.5	1.76
7.0	143 6 50.9	3 57 44.5	14 49.2	54 17.67	0.530	22.4	7	L	6 43.4	1.73
7.5	149 2 29.3	4 16 45.5	14 47.9	54 12.63	0.310	22.9	7	U	19 4.0	1.70
8.0	154 57 46.2	-4 33 0.0	14 47.2	54 10.20	-0.097	23.4	8	L	7 24.3	1.66
8.5	160 53 16.6	4 46 19.1	14 47.2	54 10.27	+0.107	23.9	8	U	19 44.5	1.68
9.0	166 49 34.2	4 56 35.0	14 47.9	54 12.75	0.304	24.4	9	L	8 4.7	1.69
9.5	172 47 9.7	5 3 40.3	14 49.2	54 17.52	0.488	24.9	9	U	20 25.1	1.71
10.0	178 46 30.8	5 7 28.5	14 51.1	54 24.41	0.659	25.4	10	L	8 45.8	1.73
10.5	184 48 2.1	-5 7 53.9	14 53.5	54 33.25	+0.813	25.9	10	U	21 6.7	1.77
11.0	190 52 4.7	5 4 52.2	14 56.4	54 43.84	0.947	26.4	11	L	9 28.1	1.81
11.5	196 58 56.4	4 58 20.4	14 59.6	54 55.91	1.062	26.9	11	U	21 50.2	1.87
12.0	203 8 50.9	4 48 17.5	15 3.3	55 9.26	1.159	27.4	12	L	10 13.0	1.93
12.5	209 21 58.4	4 34 44.7	15 7.2	55 23.64	1.233	27.9	12	U	22 36.6	2.00
13.0	215 38 25.6	-4 17 45.6	15 11.3	55 38.78	+1.286	28.4	13	L	11 0.9	2.07
13.5	221 53 15.8	3 57 26.6	15 15.6	55 54.44	1.331	28.9	13	U	23 26.1	2.14
14.0	228 21 29.3	3 33 57.4	15 20.0	56 10.41	1.336	29.4			.....	...
14.5	234 48 3.9	3 7 30.8	15 24.3	56 26.42	1.331	0.2	14	L	11 52.2	2.21
15.0	241 17 55.4	2 38 22.8	15 28.6	56 42.29	1.311	0.7	15	U	0 19.0	2.27
15.5	247 50 57.8	-2 6 53.1	15 32.9	56 57.84	+1.278	1.2	15	L	12 46.6	2.32
16.0	254 27 4.4	-1 33 24.3	15 37.0	57 12.92	+1.233	1.7	16	U	1 14.6	2.35

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
									h m	m	
Nov. 16.0	254 27 4.4	-1 33 24.3	15 37.0	57 12.92	+1.233	1.7	Nov. 16	U	1 14.6	2.35	
16.5	261 6 7.9	0 58 21.8	15 40.9	57 27.41	1.181	2.2	16	L	13 43.0	2.37	
17.0	267 48 1.3	-0 22 13.8	15 44.7	57 41.25	1.124	2.7	17	U	2 11.5	2.38	
17.5	274 32 37.9	+0 14 29.6	15 48.3	57 54.35	1.060	3.2	17	L	14 40.0	2.37	
18.0	281 19 51.9	0 51 16.9	15 51.6	58 6.68	0.996	3.7	18	U	3 8.2	2.34	
18.5	288 9 38.0	+1 27 35.4	15 54.8	58 18.25	+0.932	4.2	18	L	15 36.1	2.30	
19.0	295 1 51.8	2 2 52.1	15 57.7	58 29.05	0.867	4.7	19	U	4 3.4	2.26	
19.5	301 56 29.3	2 36 34.2	16 0.5	58 39.06	0.802	5.2	19	L	16 30.3	2.22	
20.0	308 53 26.5	3 8 9.5	16 3.0	58 48.29	0.736	5.7	20	U	4 56.6	2.17	
20.5	315 52 38.9	3 37 7.1	16 5.3	58 56.70	0.666	6.2	20	L	17 22.4	2.13	
21.0	322 54 0.7	+4 2 57.9	16 7.3	59 4.25	+0.591	6.7	21	U	5 47.8	2.10	
21.5	329 57 24.3	4 25 15.5	16 9.1	59 10.87	0.509	7.2	21	L	18 12.8	2.08	
22.0	337 2 39.5	4 43 36.1	16 10.6	59 16.44	0.419	7.7	22	U	6 37.7	2.07	
22.5	344 9 32.7	4 57 39.3	16 11.8	59 20.87	0.317	8.2	22	L	19 2.5	2.07	
23.0	351 17 46.8	5 7 9.4	16 12.7	59 23.99	0.200	8.7	23	U	7 27.4	2.08	
23.5	358 27 0.5	+5 11 54.7	16 13.2	59 25.62	+0.069	9.2	23	L	19 52.4	2.10	
24.0	5 36 48.6	5 11 48.9	16 13.1	59 25.60	-0.076	9.7	24	U	8 17.8	2.13	
24.5	12 46 41.7	5 6 51.3	16 12.6	59 23.75	0.235	10.2	24	L	20 43.7	2.17	
25.0	19 56 7.5	4 57 6.9	16 11.6	59 19.90	0.406	10.7	25	U	9 10.0	2.22	
25.5	27 4 31.0	4 42 46.5	16 10.0	59 13.98	0.583	11.2	25	L	21 36.9	2.27	
26.0	34 11 15.6	+4 24 6.6	16 7.8	59 5.89	-0.765	11.7	26	U	10 4.4	2.31	
26.5	41 15 44.5	4 1 28.6	16 5.0	58 55.61	0.946	12.2	26	L	22 32.4	2.36	
27.0	48 17 22.2	3 35 18.7	16 1.6	58 43.20	1.121	12.7	27	U	11 0.9	2.39	
27.5	55 15 35.1	3 6 6.7	15 57.7	58 28.76	1.281	13.2	27	L	23 29.7	2.40	
28.0	62 9 53.7	2 34 24.9	15 53.2	58 12.53	1.423	13.7	28	U	11 58.5	2.40	
28.5	68 59 52.5	+2 0 47.2	15 48.3	57 54.71	-1.543	14.2			.....	...
29.0	75 45 11.7	1 25 48.0	15 43.2	57 35.62	1.634	14.7	29	L	0 27.3	2.39	
29.5	82 25 37.3	0 50 1.0	15 37.7	57 15.62	1.696	15.2	29	U	12 55.7	2.35	
30.0	89 1 1.3	+0 13 58.5	15 32.1	56 55.05	1.725	15.7	30	L	1 23.7	2.30	
30.5	95 31 21.8	-0 21 49.2	15 26.5	56 34.34	1.721	16.2	30	U	13 50.9	2.24	
Dec. 1.0	101 56 43.5	-0 56 54.4	15 20.9	56 13.87	-1.685	16.7	Dec. 1	L	2 17.3	2.17	
1.5	108 17 16.0	1 30 51.9	15 15.5	55 54.02	1.617	17.2	1	U	14 42.8	2.09	
2.0	114 33 14.6	2 3 19.9	15 10.4	55 35.18	1.519	17.7	2	L	3 7.4	2.01	
2.5	120 44 59.3	2 33 59.2	15 5.6	55 17.67	1.396	18.2	2	U	15 31.2	1.94	
3.0	126 52 53.9	3 2 33.2	15 1.2	55 1.78	1.248	18.7	3	L	3 54.1	1.88	
3.5	132 57 26.1	-3 28 47.6	14 57.4	54 47.80	-1.079	19.2	3	U	16 16.3	1.82	
4.0	138 59 6.3	3 52 30.4	14 54.2	54 35.95	0.893	19.7	4	L	4 37.8	1.77	
4.5	144 58 27.1	4 13 31.1	14 51.6	54 26.42	0.693	20.2	4	U	16 58.8	1.73	
5.0	150 56 3.0	4 31 40.9	14 49.7	54 19.36	0.482	20.7	5	L	5 19.5	1.70	
5.5	156 52 29.6	4 46 52.1	14 48.5	54 14.88	0.264	21.2	5	U	17 39.8	1.66	
6.0	162 48 23.5	-4 58 58.0	14 48.0	54 13.05	-0.042	21.7	6	L	6 0.0	1.68	
6.5	168 44 21.3	5 7 52.4	14 48.2	54 13.88	+0.180	22.2	6	U	18 20.2	1.68	
7.0	174 40 59.3	5 13 30.3	14 49.2	54 17.38	0.401	22.7	7	L	6 40.4	1.70	
7.5	180 38 52.9	5 15 46.8	14 50.8	54 23.48	0.614	23.2	7	U	19 1.0	1.72	
8.0	186 38 36.5	5 14 38.2	14 53.2	54 32.09	0.819	23.7	8	L	7 21.9	1.76	
8.5	192 40 42.8	-5 10 1.2	14 56.2	54 43.09	+1.012	24.2	8	U	19 43.3	1.80	
9.0	198 45 41.9	-5 1 53.8	14 59.8	54 56.31	+1.188	24.7	9	L	8 5.3	1.86	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	" ' "	" ' "	" "	" "	" "	d		h m	m	
Dec. 9.0	198 45 41.9	-5 1 53.8	14 59.8	54 56.31	+1.188	24.7	Dec. 9	L 8 5.3	1.86	
9.5	204 54 1.3	4 50 15.4	15 3.9	55 11.53	1.344	25.2	9	U 20 28.0	1.93	
10.0	211 6 5.2	4 35 6.9	15 8.5	55 28.48	1.477	25.7	10	L 8 51.6	2.00	
10.5	217 22 14.2	4 16 31.5	15 13.5	55 46.87	1.585	26.2	10	U 21 16.0	2.08	
11.0	223 42 44.7	3 54 34.8	15 18.9	56 6.40	1.664	26.7	11	L 9 41.4	2.16	
11.5	230 7 48.2	-3 29 25.5	15 24.4	56 26.69	+1.710	27.2	11	U 22 7.8	2.23	
12.0	236 37 31.8	3 1 15.7	15 30.0	56 47.33	1.725	27.7	12	L 10 35.0	2.30	
12.5	243 11 57.2	2 30 21.3	15 35.6	57 7.98	1.709	28.2	12	U 23 3.0	2.36	
13.0	249 51 1.2	1 57 2.2	15 41.2	57 28.22	1.658	28.7		.....	...
13.5	256 34 35.5	1 21 42.5	15 46.5	57 47.66	1.577	29.2	13	L 11 31.6	2.41	
14.0	263 22 26.9	-0 44 50.0	15 51.4	58 5.95	+1.466	0.1	14	U 0 0.7	2.43	
14.5	270 14 17.9	-0 6 56.1	15 56.0	58 22.75	1.330	0.6	14	L 12 29.9	2.44	
15.0	277 9 47.3	+0 31 24.6	16 0.1	58 37.79	1.175	1.1	15	U 0 59.1	2.42	
15.5	284 8 30.7	1 9 35.4	16 3.7	58 50.89	1.006	1.6	15	L 13 28.0	2.40	
16.0	291 10 1.2	1 46 58.5	16 6.7	59 1.88	0.824	2.1	16	U 1 56.5	2.35	
16.5	298 13 50.8	+2 22 55.8	16 9.1	59 10.67	+0.641	2.6	16	L 14 24.5	2.30	
17.0	305 19 30.5	2 56 50.2	16 10.9	59 17.30	0.463	3.1	17	U 2 51.8	2.25	
17.5	312 26 31.2	3 28 6.5	16 12.1	59 21.80	0.289	3.6	17	L 15 18.5	2.20	
18.0	319 34 24.9	3 56 12.6	16 12.8	59 24.29	+0.128	4.1	18	U 3 44.6	2.15	
18.5	326 42 44.9	4 20 40.1	16 13.0	59 24.91	-0.021	4.6	18	L 16 10.2	2.11	
19.0	333 51 6.0	+4 41 4.9	16 12.7	59 23.83	-0.155	5.1	19	U 4 35.4	2.08	
19.5	340 59 5.3	4 57 7.8	16 12.0	59 21.23	0.276	5.6	19	L 17 0.3	2.06	
20.0	348 6 21.7	5 8 34.7	16 10.9	59 17.26	0.382	6.1	20	U 5 25.0	2.06	
20.5	355 12 36.6	5 15 16.7	16 9.5	59 12.11	0.475	6.6	20	L 17 49.7	2.06	
21.0	2 17 32.9	5 17 9.9	16 7.8	59 5.92	0.556	7.1	21	U 6 14.5	2.08	
21.5	9 20 55.4	+5 14 15.4	16 5.8	58 58.79	-0.632	7.6	21	L 18 39.6	2.10	
22.0	16 22 30.3	5 6 39.3	16 3.7	58 50.78	0.702	8.1	22	U 7 5.0	2.13	
22.5	23 22 5.1	4 54 32.1	16 1.3	58 41.97	0.767	8.6	22	L 19 30.9	2.17	
23.0	30 19 27.8	4 38 8.5	15 58.6	58 32.36	0.832	9.1	23	U 7 57.2	2.22	
23.5	37 14 27.3	4 17 46.9	15 55.8	58 22.00	0.896	9.6	23	L 20 24.1	2.26	
24.0	44 6 53.1	+3 53 49.3	15 52.8	58 10.85	-0.961	10.1	24	U 8 51.4	2.30	
24.5	50 56 34.7	3 26 40.6	15 49.5	57 58.94	1.025	10.6	24	L 21 19.2	2.33	
25.0	57 43 22.6	2 56 48.1	15 46.1	57 46.25	1.090	11.1	25	U 9 47.3	2.35	
25.5	64 27 7.1	2 24 40.9	15 42.4	57 32.80	1.150	11.6	25	L 22 15.5	2.35	
26.0	71 7 39.8	1 50 49.4	15 38.6	57 18.67	1.206	12.1	26	U 10 43.7	2.34	
26.5	77 44 52.8	+1 15 44.6	15 34.5	57 3.89	-1.256	12.6	26	L 23 11.7	2.31	
27.0	84 18 39.7	0 39 57.4	15 30.4	56 48.58	1.295	13.1	27	U 11 39.2	2.26	
27.5	90 48 55.6	+0 3 58.0	15 26.1	56 32.86	1.323	13.6		.....	...
28.0	97 15 37.1	-0 31 44.5	15 21.7	56 16.90	1.334	14.1	28	L 0 6.2	2.22	
28.5	103 38 43.6	1 6 42.7	15 17.4	56 0.91	1.327	14.6	28	U 12 32.4	2.15	
29.0	109 58 16.5	-1 40 31.4	15 13.1	55 45.13	-1.302	15.1	29	L 0 57.9	2.09	
29.5	116 14 20.2	2 12 47.6	15 8.9	55 29.73	1.259	15.6	29	U 13 22.5	2.02	
30.0	122 27 1.8	2 43 11.0	15 4.8	55 15.00	1.194	16.1	30	L 1 46.3	1.95	
30.5	128 36 31.4	3 11 23.5	15 1.1	55 1.17	1.108	16.6	30	U 14 9.3	1.89	
31.0	134 43 2.1	3 37 9.8	14 57.6	54 48.50	1.000	17.1	31	L 2 31.5	1.83	
31.5	140 46 50.4	-4 0 17.1	14 54.6	54 37.25	-0.873	17.6	31	U 14 53.2	1.78	
32.0	146 48 15.4	-4 20 34.5	14 51.9	54 27.63	-0.726	18.1	32	L 3 14.3	1.74	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit Meridian of Green- wich.	
	Noon.				Noon.									
		h	m	s		°	'	"		Noon.	Noon.	Noon.	h	m
Jan.	1	20	8	54.66	+11.874	-21	30	48.2	+60.35	0.013 0168	-4399.8	3.24	8.54	1 26.7
	2	20	13	28.72	10.945	21	6	26.3	61.39	0.002 1984	4614.9	3.32	8.76	1 27.3
	3	20	17	39.05	9.895	20	41	46.3	61.84	9.990 8704	4823.6	3.42	8.99	1 27.5
	4	20	21	22.61	8.713	20	17	3.3	61.62	9.979 0547	5020.1	3.50	9.23	1 27.2
	5	20	24	36.17	7.394	19	52	34.5	60.64	9.966 7889	5197.6	3.60	9.50	1 26.5
	6	20	27	16.37	+ 5.933	-19	28	38.9	+58.85	9.954 1282	-5347.5	3.71	9.78	1 25.2
	7	20	29	19.82	4.331	19	5	36.6	56.19	9.941 1515	5469.2	3.82	10.08	1 23.3
	8	20	30	43.18	2.595	18	43	48.9	52.63	9.927 9630	5522.0	3.95	10.39	1 20.7
	9	20	31	23.42	+ 0.741	18	23	37.3	48.19	9.914 6949	5523.4	4.07	10.71	1 17.4
	10	20	31	18.02	- 1.204	18	5	22.8	42.89	9.901 5099	5450.6	4.19	11.04	1 13.3
	11	20	30	25.18	- 3.204	-17	49	24.8	+36.83	9.888 6007	-5291.9	4.32	11.37	1 8.5
	12	20	28	44.22	5.205	17	35	59.7	30.17	9.876 1852	5037.7	4.44	11.70	1 2.9
	13	20	26	15.80	7.147	17	25	20.1	23.07	9.864 5017	4681.2	4.56	12.02	0 56.4
	14	20	23	2.20	8.957	17	17	33.7	15.78	9.853 7984	4221.3	4.68	12.32	0 49.2
	15	20	19	7.50	10.560	17	12	42.3	8.53	9.844 3184	3663.0	4.78	12.59	0 41.4
	16	20	14	37.56	-11.882	-17	10	41.6	+ 1.59	9.836 2854	-3018.2	4.87	12.83	0 33.0
	17	20	9	39.92	12.860	17	11	22.0	- 4.85	9.829 8848	2306.3	4.94	13.02	0 24.2
	18	20	4	23.41	13.449	17	14	28.8	10.59	9.825 2497	1551.6	4.99	13.16	0 15.0
	19	19	58	57.65	13.629	17	19	44.0	15.54	9.822 4495	781.6	5.03	13.24	0 8.4
	20	19	53	32.43	13.407	17	26	47.8	19.63	9.821 4873	- 24.8	5.04	13.27	23 47.3
	21	19	48	17.09	-12.813	-17	35	19.7	-22.89	9.822 2990	+ 693.0	5.03	13.25	23 38.4
	22	19	43	19.99	11.896	17	45	0.4	25.37	9.824 7659	1351.3	5.00	13.17	23 30.0
	23	19	38	48.13	10.720	17	55	31.7	27.15	9.828 7258	1935.4	4.95	13.05	23 22.1
	24	19	34	46.90	9.355	18	6	37.7	28.27	9.833 9895	2436.8	4.90	12.90	23 14.7
	25	19	31	20.11	7.863	18	18	4.3	28.86	9.840 3545	2853.2	4.82	12.71	23 7.9
	26	19	28	30.01	- 6.305	-18	29	39.5	-29.00	9.847 6194	+3187.5	4.74	12.50	23 1.8
	27	19	26	17.62	4.729	18	41	13.0	28.73	9.855 5930	3444.9	4.66	12.27	22 56.2
	28	19	24	42.83	3.176	18	52	35.6	28.10	9.864 0995	3633.2	4.56	12.03	22 51.3
	29	19	23	44.76	1.674	19	3	39.5	27.17	9.872 9844	3761.7	4.48	11.79	22 47.0
	30	19	23	21.92	- 0.242	19	14	17.8	25.98	9.882 1147	3839.0	4.38	11.54	22 43.2
	31	19	23	32.45	+ 1.105	-19	24	24.4	-24.53	9.891 3776	+3873.9	4.29	11.30	22 39.9
Feb.	1	19	24	14.25	2.363	19	33	53.7	22.88	9.900 6817	3874.3	4.19	11.06	22 37.2
	2	19	25	25.14	3.529	19	42	40.9	21.02	9.909 9518	3846.7	4.11	10.83	22 34.8
	3	19	27	2.92	4.604	19	50	41.4	19.00	9.919 1287	3797.5	4.02	10.60	22 32.9
	4	19	29	5.44	5.592	19	57	51.5	16.82	9.928 1665	3751.5	3.94	10.38	22 31.3
	5	19	31	30.64	+ 6.495	-20	4	7.7	-14.50	9.937 0296	+3652.7	3.86	10.17	22 30.1
	6	19	34	16.58	7.321	20	9	26.7	12.06	9.945 6924	3565.0	3.79	9.97	22 29.3
	7	19	37	21.46	8.074	20	13	45.8	9.51	9.954 1365	3470.7	3.71	9.78	22 28.7
	8	19	40	43.60	8.761	20	17	2.4	6.86	9.962 3487	3372.3	3.64	9.60	22 28.4
	9	19	44	21.48	9.346	20	19	14.4	4.13	9.970 3216	3271.4	3.58	9.42	22 28.3
	10	19	48	13.70	+ 9.956	-20	20	20.0	- 1.32	9.978 0505	+3169.4	3.51	9.26	22 28.4
	11	19	52	18.98	10.475	20	20	17.2	+ 1.56	9.985 5349	3067.5	3.46	9.10	22 28.7
	12	19	56	36.14	10.948	20	19	4.6	4.49	9.992 7753	2966.3	3.40	8.95	22 29.2
	13	20	1	4.16	11.380	20	16	41.1	7.48	9.999 7745	2866.7	3.34	8.80	22 29.9
	14	20	5	42.05	11.772	20	13	5.3	10.51	0.006 5370	2768.9	3.29	8.67	22 30.7
	15	20	10	28.96	+12.131	-20	8	16.5	+13.57	0.013 0671	+2673.2	3.24	8.54	22 31.7
	16	20	15	24.11	+12.459	-20	2	13.6	+16.67	0.019 3706	+2580.1	3.20	8.42	22 32.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	h m	
	h	m	s	s	°	'	"	"			"	"		
Feb.	16	20	15	24.11	+12.459	-20	2	13.6	+ 16.67	0.019 3706	+2580.1	3.20	8.42	22 32.8
	17	20	20	26.77	12.758	19	54	56.1	19.79	0.025 4536	2489.5	3.15	8.30	22 34.0
	18	20	25	36.31	13.033	19	46	23.3	22.94	0.031 3224	2401.6	3.11	8.19	22 35.3
	19	20	30	52.15	13.283	19	36	34.7	26.11	0.036 9832	2316.2	3.06	8.08	22 36.8
	20	20	36	13.74	13.513	19	25	30.0	29.29	0.042 4425	2233.6	3.03	7.98	22 38.3
	21	20	41	40.62	+13.724	-19	13	8.8	+ 32.48	0.047 7065	+2153.6	2.99	7.88	22 39.8
	22	20	47	12.35	13.918	18	59	30.9	35.69	0.052 7817	2076.1	2.96	7.79	22 41.5
	23	20	52	48.57	14.097	18	44	35.9	38.90	0.057 6736	2001.0	2.92	7.71	22 43.2
	24	20	58	28.90	14.262	18	28	23.9	42.11	0.062 3883	1928.2	2.89	7.62	22 45.0
	25	21	4	13.06	14.415	18	10	54.7	45.32	0.066 9309	1857.7	2.86	7.54	22 46.9
	26	21	10	0.75	+14.557	-17	52	8.3	+ 48.55	0.071 3068	+1789.2	2.84	7.47	22 48.8
	27	21	15	51.74	14.690	17	32	4.4	51.77	0.075 5206	1722.5	2.81	7.39	22 50.7
Mar.	28	21	21	45.81	14.815	17	10	43.3	54.99	0.079 5762	1657.5	2.78	7.33	22 52.7
	1	21	27	42.78	14.932	16	48	4.9	58.21	0.083 4781	1594.2	2.76	7.26	22 54.8
	2	21	33	42.49	15.043	16	24	9.3	61.43	0.087 2294	1532.1	2.74	7.20	22 56.9
	3	21	39	44.80	+15.149	-15	58	56.4	+ 64.64	0.090 8333	+1471.2	2.72	7.14	22 59.0
	4	21	45	49.59	15.250	15	32	26.5	67.85	0.094 2922	1411.4	2.69	7.08	23 1.2
	5	21	51	56.77	15.348	15	4	39.6	71.05	0.097 6085	1352.2	2.67	7.03	23 3.4
	6	21	58	6.26	15.443	14	35	36.0	74.25	0.100 7831	1293.4	2.65	6.98	23 5.7
	7	22	4	18.01	15.536	14	5	15.7	77.44	0.103 8174	1235.2	2.63	6.93	23 8.0
	8	22	10	31.98	+15.628	-13	33	38.9	+ 80.62	0.106 7123	+1177.1	2.61	6.88	23 10.3
	9	22	16	48.16	15.720	13	0	46.0	83.79	0.109 4673	1118.7	2.60	6.84	23 12.7
	10	22	23	6.52	15.811	12	26	37.1	86.95	0.112 0817	1059.9	2.58	6.80	23 15.1
	11	22	29	27.11	15.904	11	51	12.5	90.10	0.114 5543	1000.5	2.56	6.76	23 17.5
	12	22	35	49.94	15.998	11	14	32.5	93.23	0.116 8833	940.1	2.55	6.72	23 20.0
	13	22	42	15.04	+16.094	-10	36	37.7	+ 96.34	0.119 0658	+ 878.4	2.54	6.69	23 22.5
	14	22	48	42.48	16.193	9	57	28.3	99.44	0.121 0981	815.0	2.52	6.66	23 25.1
	15	22	55	12.33	16.295	9	17	5.0	102.50	0.122 9763	749.7	2.51	6.63	23 27.7
	16	23	1	44.65	16.400	8	35	28.4	105.55	0.124 6949	682.0	2.50	6.60	23 30.3
	17	23	8	19.54	16.509	7	52	39.0	108.56	0.126 2479	611.6	2.49	6.58	23 33.0
	18	23	14	57.09	+16.621	-	7	8 38.0	+111.52	0.127 6280	+ 537.9	2.49	6.56	23 35.7
	19	23	21	37.41	16.739	6	23	26.2	114.45	0.128 8270	460.6	2.49	6.55	23 38.5
20	23	28	20.60	16.861	5	37	4.8	117.32	0.129 8357	379.0	2.48	6.53	23 41.3	
21	23	35	6.76	16.986	4	49	35.3	120.15	0.130 6432	293.0	2.47	6.51	23 44.2	
22	23	41	55.99	17.117	4	0	59.3	122.86	0.131 2380	201.7	2.47	6.50	23 47.2	
23	23	48	48.41	+17.252	-	3	11 18.9	+125.50	0.131 6067	+ 104.5	2.47	6.50	23 50.2	
24	23	55	44.10	17.389	2	20	36.3	128.03	0.131 7347	+ 1.0	2.47	6.50	23 53.2	
25	0	2	43.12	17.530	1	28	54.3	130.44	0.131 6060	- 109.5	2.47	6.50	23 56.3	
26	0	9	45.54	17.672	-	0	36 16.2	132.71	0.131 2031	227.6	2.47	6.50	23 59.5	
27	0	16	51.37	17.814	+ 0	17	14.2	134.80	0.130 5072	353.7	2.47	6.51	...	
28	0	24	0.61	+17.955	+ 1	11	32.6	+136.69	0.129 4981	- 488.7	2.48	6.53	0 2.7	
29	0	31	13.19	18.092	2	6	33.6	138.35	0.128 1539	632.9	2.49	6.55	0 6.0	
30	0	38	28.99	18.223	3	2	11.4	139.75	0.126 4526	786.6	2.49	6.58	0 9.3	
31	0	45	47.83	18.345	3	58	19.2	140.84	0.124 3705	950.1	2.50	6.61	0 12.7	
Apr.	1	0	53	9.44	18.454	4	54	49.1	141.59	0.121 8842	1123.5	2.52	6.65	0 16.1
2	1	0	33.46	+18.546	+ 5	51	32.5	+141.96	0.118 9700	-1306.6	2.54	6.69	0 19.6	
3	1	7	59.43	+18.615	+ 6	48	19.6	+141.90	0.115 6050	-1409.0	2.56	6.74	0 23.1	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paralax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"					h m
Apr.	1	0 53	9.44	+18.454	+ 4 54	49.1		+141.59	0.121 8842	-1123.5	2.52	6.65	0 16.1
	2	1 0	33.46	18.545	5 51	32.5		141.96	0.118 9700	1306.6	2.54	6.69	0 19.6
	3	1 7	59.43	18.615	6 48	19.6		141.90	0.115 6050	1499.0	2.56	6.74	0 23.1
	4	1 15	26.78	18.659	7 44	59.8		141.37	0.111 7679	1700.0	2.58	6.80	0 26.6
	5	1 22	54.82	18.672	8 41	21.5		140.35	0.107 4392	1908.4	2.61	6.87	0 30.1
	6	1 30	22.76	+18.650	+ 9 37	12.4		+138.80	0.102 6027	-2122.9	2.64	6.95	0 33.7
	7	1 37	49.68	18.586	10 32	19.7		136.71	0.097 2457	2341.9	2.67	7.03	0 37.2
	8	1 45	14.55	18.479	11 26	30.2		134.07	0.091 3598	2563.3	2.71	7.13	0 40.7
	9	1 52	36.28	18.324	12 19	30.5		130.87	0.084 9417	2785.0	2.75	7.24	0 44.1
	10	1 59	53.67	18.117	13 11	7.6		127.14	0.077 9935	3004.6	2.79	7.35	0 47.4
	11	2 7	5.48	+17.858	+14 1	8.9		+122.89	0.070 5228	-3220.1	2.84	7.48	0 50.7
	12	2 14	10.45	17.547	14 49	22.7		118.18	0.062 5424	3429.0	2.89	7.62	0 53.8
	13	2 21	7.30	17.182	15 35	38.2		113.05	0.054 0706	3629.3	2.95	7.77	0 56.8
	14	2 27	54.78	16.766	16 19	46.0		107.54	0.045 1301	3819.1	3.01	7.93	0 59.7
	15	2 34	31.66	16.299	17 1	37.7		101.72	0.035 7480	3997.2	3.07	8.10	1 2.4
	16	2 40	56.76	+15.785	+17 41	6.6		+ 95.65	0.025 9540	-4162.1	3.15	8.29	1 4.8
	17	2 47	8.97	15.225	18 18	7.3		89.38	0.015 7815	4312.7	3.23	8.49	1 7.1
	18	2 53	7.24	14.624	18 52	35.5		82.95	0.005 2649	4448.6	3.30	8.69	1 9.1
	19	2 58	50.60	13.983	19 24	28.3		76.43	9.994 4403	4569.3	3.38	8.91	1 10.9
	20	3 4	18.11	13.304	19 53	43.8		69.85	9.983 3448	4674.3	3.47	9.14	1 12.4
	21	3 9	28.92	+12.592	+20 20	21.0		+ 63.24	9.972 0163	-4763.5	3.57	9.39	1 13.6
	22	3 14	22.26	11.848	20 44	19.5		56.63	9.960 4928	4836.8	3.66	9.64	1 14.5
	23	3 18	57.38	11.074	21 5	39.5		50.04	9.948 8128	4893.8	3.76	9.90	1 15.1
	24	3 23	13.60	10.274	21 24	21.7		43.48	9.937 0159	4934.3	3.86	10.17	1 15.5
	25	3 27	10.31	9.448	21 40	27.0		36.97	9.925 1414	4968.2	3.97	10.46	1 15.4
	26	3 30	46.94	+ 8.601	+21 53	56.6		+ 30.51	9.913 2301	-4965.0	4.08	10.75	1 15.1
	27	3 34	2.98	7.733	22 4	51.9		24.11	9.901 3236	4954.1	4.19	11.04	1 14.4
	28	3 36	57.99	6.849	22 13	14.3		17.76	9.889 4651	4925.0	4.31	11.35	1 13.4
	29	3 39	31.61	5.951	22 19	5.1		11.49	9.877 6990	4876.8	4.42	11.66	1 12.0
	30	3 41	43.55	5.043	22 22	26.1		+ 5.27	9.866 0723	4808.8	4.54	11.98	1 10.2
May	1	3 43	33.64	+ 4.131	+22 23	18.7		- 0.89	9.854 6334	-4720.0	4.67	12.30	1 8.1
	2	3 45	1.82	3.218	22 21	44.8		6.93	9.843 4337	4609.5	4.79	12.62	1 5.6
	3	3 46	8.14	2.311	22 17	46.7		12.90	9.832 5260	4476.4	4.91	12.94	1 2.7
	4	3 46	52.83	1.416	22 11	26.7		18.75	9.821 9659	4319.7	5.03	13.26	0 59.5
	5	3 47	16.28	+ 0.542	22 2	48.1		24.45	9.811 8108	4138.9	5.15	13.57	0 56.0
	6	3 47	19.10	- 0.302	+21 51	54.5		- 29.98	9.802 1191	-3933.3	5.27	13.88	0 52.1
	7	3 47	2.08	1.110	21 38	50.8		35.29	9.792 9509	3702.8	5.38	14.17	0 47.9
	8	3 46	26.22	1.870	21 23	42.9		40.32	9.784 3653	3447.6	5.49	14.46	0 43.3
	9	3 45	32.77	2.574	21 6	37.9		45.03	9.776 4216	3168.2	5.59	14.72	0 38.5
	10	3 44	23.19	3.212	20 47	44.6		49.35	9.769 1760	2966.1	5.68	14.97	0 33.4
	11	3 42	59.19	- 3.775	+20 27	12.9		- 53.20	9.762 6814	-2542.7	5.77	15.20	0 28.1
	12	3 41	22.64	4.256	20 5	15.0		56.53	9.756 9863	2200.2	5.84	15.40	0 22.5
	13	3 39	35.62	4.647	19 42	4.0		59.27	9.752 1333	1841.7	5.90	15.57	0 16.8
	14	3 37	40.33	4.944	19 17	55.1		61.36	9.748 1561	1470.6	5.96	15.72	0 11.0
	15	3 35	39.08	5.143	18 53	4.5		62.74	9.745 0818	1090.3	6.00	15.83	0 5.1
	16	3 33	34.26	- 5.242	+18 27	49.3		- 63.39	9.742 9268	- 705.0	6.03	15.91	23 53.0
	17	3 31	28.25	- 5.242	+18 2	27.7		- 63.28	9.741 6986	- 318.8	6.05	15.95	23 47.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m
May	17	3	31	28.25	- 5.242	+18	2	27.7	-63.28	9.741 6986	- 318.8	6.05	15.95	23 47.0
	18	3	29	23.38	5.148	17	37	17.8	62.41	9.741 3937	+ 68.9	6.05	15.96	23 41.1
	19	3	27	21.90	4.900	17	12	37.9	60.80	9.741 9996	439.4	6.04	15.94	23 35.3
	20	3	25	25.98	4.687	16	48	45.3	58.46	9.743 4938	808.8	6.02	15.88	23 29.5
	21	3	23	37.56	4.355	16	25	56.9	55.47	9.745 8462	1158.8	5.99	15.80	23 23.9
	22	3	21	58.45	- 3.913	+16	4	27.7	-51.87	9.749 0184	+1486.7	5.95	15.68	23 18.5
	23	3	20	30.23	3.429	15	44	31.5	47.73	9.752 9668	1800.2	5.90	15.54	23 13.4
	24	3	19	14.28	2.892	15	26	20.1	43.15	9.757 6426	2092.7	5.83	15.38	23 8.4
	25	3	18	11.76	2.311	15	10	3.4	38.19	9.762 9943	2368.2	5.76	15.19	23 3.6
	26	3	17	23.64	1.694	14	55	49.5	32.93	9.768 9679	2611.0	5.68	14.98	22 59.1
	27	3	16	50.67	- 1.049	+14	43	44.3	-27.47	9.775 5087	+2836.0	5.60	14.76	22 54.9
	28	3	16	33.44	- 0.384	14	33	52.0	21.87	9.782 5625	3088.3	5.50	14.52	22 51.0
	29	3	16	32.35	+ 0.296	14	26	15.0	16.21	9.790 0763	3219.4	5.41	14.27	22 47.3
	30	3	16	47.70	0.984	14	20	54.2	10.53	9.797 9992	3379.6	5.31	14.01	22 43.9
	31	3	17	19.63	1.677	14	17	49.1	- 4.91	9.806 2825	3519.9	5.22	13.75	22 40.7
June	1	3	18	8.21	+ 2.371	+14	16	57.9	+ 0.62	9.814 8801	+5641.9	5.11	13.48	22 37.8
	2	3	19	13.40	3.062	14	18	17.9	6.02	9.823 7498	5746.7	5.01	13.20	22 35.3
	3	3	20	35.14	3.749	14	21	45.4	11.24	9.832 8515	5835.5	4.90	12.93	22 32.9
	4	3	22	13.28	4.429	14	27	16.1	16.28	9.842 1487	5909.9	4.80	12.66	22 30.9
	5	3	24	7.65	5.101	14	34	45.1	21.10	9.851 6080	5970.7	4.70	12.38	22 29.1
	6	3	26	18.09	+ 5.767	+14	44	6.9	+25.68	9.861 1983	+6019.4	4.59	12.11	22 27.6
	7	3	28	44.42	6.425	14	55	15.9	30.02	9.870 8920	6066.9	4.50	11.85	22 26.3
	8	3	31	26.44	7.075	15	8	6.0	34.11	9.880 6629	6084.0	4.39	11.58	22 25.3
	9	3	34	23.97	7.718	15	22	30.9	37.98	9.890 4875	6101.7	4.30	11.32	22 24.6
	10	3	37	36.86	8.356	15	38	24.2	41.47	9.900 3444	6111.0	4.20	11.07	22 24.1
	11	3	41	4.98	+ 8.987	+15	55	39.3	+44.74	9.910 2139	+6112.1	4.10	10.82	22 23.9
	12	3	44	48.18	9.613	16	14	9.5	47.73	9.920 0765	6106.7	4.01	10.58	22 23.9
	13	3	48	46.40	10.238	16	33	47.9	50.42	9.929 9156	6092.8	3.93	10.34	22 24.1
	14	3	52	59.57	10.859	16	54	27.5	52.83	9.939 7143	6072.2	3.85	10.11	22 24.6
	15	3	57	27.64	11.481	17	16	1.4	54.94	9.949 4571	6045.6	3.76	9.89	22 25.4
	16	4	2	10.64	+12.102	+17	38	22.2	+56.74	9.959 1281	+6012.5	3.67	9.67	22 26.4
	17	4	7	8.56	12.725	18	1	22.4	58.22	9.968 7121	5973.1	3.59	9.46	22 27.7
	18	4	12	21.46	13.350	18	24	54.4	59.39	9.978 1936	5927.1	3.51	9.25	22 29.2
	19	4	17	49.40	13.979	18	48	50.2	60.21	9.987 5568	5874.4	3.44	9.06	22 30.9
	20	4	23	32.46	14.611	19	13	1.7	60.69	9.996 7852	5814.7	3.37	8.87	22 32.9
	21	4	29	30.73	+15.245	+19	37	20.1	+60.79	0.005 8618	+5747.9	3.29	8.68	22 35.2
	22	4	35	44.26	15.883	20	1	36.5	60.51	0.014 7688	5673.3	3.23	8.51	22 37.7
	23	4	42	13.14	16.524	20	25	41.5	59.83	0.023 4870	5590.5	3.17	8.34	22 40.5
	24	4	48	57.39	17.164	20	49	25.1	58.73	0.031 9963	5499.1	3.10	8.17	22 43.6
	25	4	55	57.00	17.803	21	12	37.0	57.19	0.040 2752	5398.4	3.04	8.02	22 46.9
	26	5	3	11.88	+18.436	+21	35	6.4	+55.18	0.048 3009	+5288.1	2.98	7.87	22 50.4
	27	5	10	41.87	19.061	21	56	41.8	52.69	0.056 0501	5167.8	2.93	7.73	22 54.2
	28	5	18	26.71	19.672	22	17	11.8	49.72	0.063 4981	5037.1	2.88	7.60	22 58.3
	29	5	26	25.99	20.264	22	36	24.3	46.24	0.070 6195	4895.7	2.84	7.48	23 2.5
	30	5	34	39.19	20.831	22	54	7.1	42.25	0.077 3889	4743.7	2.79	7.36	23 7.1
July	1	5	43	5.60	+21.364	+23	10	8.2	+37.76	0.083 7811	+2581.4	2.76	7.26	23 11.8
	2	5	51	44.35	+21.857	+23	24	15.9	+32.80	0.089 7719	+2409.3	2.72	7.16	23 16.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
	h	m	s	s	°	'	"	"			"	"	h m
July	1	5 43	5.60	+21.364	+23 10	8.2		+ 37.76	0.063 7811	+2581.4	2.76	7.26	23 11.8
	2	5 51	44.35	21.857	23 24	15.9		32.80	0.089 7719	2409.3	2.72	7.16	23 16.7
	3	6 0	34.37	22.303	23 36	18.8		27.37	0.095 3386	2228.1	2.68	7.07	23 21.7
	4	6 9	34.45	22.694	23 46	6.4		21.53	0.100 4606	2039.0	2.65	6.99	23 27.0
	5	6 18	43.18	23.023	23 53	29.3		15.32	0.105 1207	1843.4	2.62	6.91	23 32.3
	6	6 27	59.02	+23.285	+23 58	19.6		+ 8.82	0.109 3053	+1643.1	2.60	6.84	23 37.7
	7	6 37	20.31	23.477	24 0	30.7		+ 2.07	0.113 0050	1459.6	2.57	6.78	23 43.2
	8	6 46	45.33	23.596	23 59	58.0		- 4.81	0.116 2146	1235.2	2.55	6.73	23 48.8
	9	6 56	12.31	23.641	23 56	39.1		11.77	0.118 9349	1032.0	2.53	6.69	23 54.3
	10	7 5	39.51	23.614	23 50	33.0		18.72	0.121 1702	831.4	2.52	6.66	23 59.8
	11	7 15	5.24	+23.519	+23 41	41.1		- 25.58	0.122 9292	+ 635.6	2.51	6.63	...
	12	7 24	27.89	23.359	23 30	6.3		32.29	0.124 2259	446.1	2.50	6.61	0 5.2
	13	7 33	46.03	23.143	23 15	53.1		38.77	0.125 0761	263.8	2.50	6.60	0 10.6
	14	7 42	58.33	22.875	22 59	7.4		44.99	0.125 4989	+ 90.1	2.49	6.59	0 15.9
	15	7 52	3.66	22.563	22 39	56.2		50.89	0.125 5156	- 74.7	2.50	6.60	0 21.1
	16	8 1	1.04	+22.213	+22 18	27.2		- 56.46	0.125 1479	- 280.0	2.50	6.60	0 26.1
	17	8 9	49.68	21.835	21 54	48.9		61.67	0.124 4192	375.7	2.50	6.61	0 31.0
	18	8 18	28.93	21.433	21 29	9.8		66.52	0.123 3518	512.1	2.51	6.62	0 35.7
	19	8 26	58.32	21.014	21 1	38.8		71.00	0.121 9682	639.4	2.52	6.64	0 40.3
	20	8 35	17.49	20.582	20 32	24.9		75.11	0.120 2897	757.9	2.53	6.67	0 44.6
	21	8 43	26.22	+20.144	+20 1	36.5		- 78.86	0.118 3368	- 868.2	2.54	6.70	0 48.9
	22	8 51	24.37	19.702	19 29	22.2		82.27	0.116 1286	970.8	2.55	6.73	0 52.9
	23	8 59	11.91	19.260	18 55	50.1		85.35	0.113 6826	1066.4	2.56	6.77	0 56.7
	24	9 6	48.87	18.821	18 21	8.0		88.11	0.111 0152	1155.6	2.58	6.81	1 0.4
	25	9 14	15.33	18.385	17 45	23.2		90.57	0.108 1406	1288.8	2.60	6.86	1 3.9
	26	9 21	31.41	+17.967	+17 8	42.8		- 92.75	0.106 0730	-1316.8	2.62	6.91	1 7.2
	27	9 28	37.31	17.536	16 31	13.3		94.67	0.101 8235	1390.3	2.64	6.97	1 10.4
	28	9 35	33.20	17.123	15 53	0.8		96.33	0.098 4028	1459.6	2.66	7.02	1 13.4
	29	9 42	19.28	16.719	15 14	11.4		97.75	0.094 8201	1525.4	2.68	7.07	1 16.2
	30	9 48	55.78	16.324	14 34	50.4		98.96	0.091 0836	1588.0	2.71	7.13	1 18.9
	31	9 55	22.91	+15.939	+13 55	3.1		- 99.95	0.087 2001	-1647.9	2.74	7.20	1 21.4
Aug.	1	10 1	40.90	15.562	13 14	54.2		100.75	0.083 1757	1705.5	2.76	7.27	1 23.7
	2	10 7	49.94	15.194	12 34	28.4		101.37	0.079 0151	1761.4	2.78	7.33	1 25.9
	3	10 13	50.27	14.835	11 53	50.0		101.81	0.074 7223	1815.7	2.81	7.41	1 28.0
	4	10 19	42.06	14.482	11 13	3.0		102.08	0.070 3009	1868.7	2.84	7.48	1 29.9
	5	10 25	25.49	+14.138	+10 32	11.5		-102.19	0.065 7530	-1920.9	2.87	7.56	1 31.7
	6	10 31	0.73	13.800	9 51	19.2		102.15	0.061 0806	1972.6	2.90	7.65	1 33.3
	7	10 36	27.92	13.467	9 10	29.7		101.96	0.056 2845	2024.0	2.93	7.73	1 34.8
	8	10 41	47.18	13.139	8 29	46.4		101.62	0.051 3654	2075.2	2.96	7.82	1 36.2
	9	10 46	58.62	12.815	7 49	12.9		101.15	0.046 3232	2126.6	3.00	7.91	1 37.4
	10	10 52	2.31	+12.493	+ 7 8	52.5		-100.53	0.041 1574	-2178.3	3.04	8.00	1 38.5
	11	10 56	58.30	12.173	6 28	48.6		99.77	0.035 8670	2230.4	3.07	8.10	1 39.5
	12	11 1	46.60	11.853	5 49	4.4		98.88	0.030 4508	2283.1	3.11	8.20	1 40.4
	13	11 6	27.23	11.532	5 9	43.3		97.85	0.024 9073	2336.6	3.15	8.31	1 41.1
	14	11 11	0.12	11.209	4 30	48.6		96.68	0.019 2346	2390.7	3.19	8.42	1 41.7
	15	11 15	25.23	+10.882	+ 3 52	23.9		- 95.36	0.013 4312	-2445.7	3.24	8.53	1 42.2
	16	11 19	42.44	+10.551	+ 3 14	32.6		- 93.89	0.007 4945	-2501.6	3.28	8.65	1 42.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Hour.	Min.	Sec.		Hour.	Min.	Sec.							
	h	m	s	s	°	'	"	"			"	"	h	m
Aug. 16	11	19	42.44	+10.551	+3	14	32.6	- 93.89	0.007 4945	-2501.6	3.28	8.65	1	42.5
17	11	23	51.61	10.212	2	37	18.2	92.27	0.001 4228	2558.2	3.32	8.77	1	42.7
18	11	27	52.56	9.866	2	0	44.7	90.49	9.995 2141	2615.8	3.38	8.90	1	42.8
19	11	31	45.08	9.509	1	24	56.0	88.54	9.988 8665	2674.0	3.43	9.03	1	42.7
20	11	35	28.90	9.140	0	49	56.3	86.41	9.982 3785	2732.7	3.47	9.16	1	42.5
21	11	39	3.72	+ 8.758	+0	15	50.0	- 84.09	9.975 7491	-2791.8	3.53	9.31	1	42.1
22	11	42	29.17	8.300	-0	17	18.2	81.57	9.968 9778	2850.9	3.59	9.45	1	41.6
23	11	45	44.85	7.946	0	49	23.4	78.82	9.962 0648	2909.9	3.64	9.60	1	40.9
24	11	48	50.30	7.507	1	20	19.9	75.85	9.955 0110	2968.1	3.70	9.76	1	40.0
25	11	51	45.00	7.047	1	50	2.0	72.62	9.947 8192	3024.9	3.76	9.92	1	39.0
26	11	54	28.38	+ 6.563	-2	18	23.6	- 69.12	9.940 4931	-3079.9	3.83	10.09	1	37.7
27	11	56	59.80	6.050	2	45	17.6	65.33	9.933 0383	3131.8	3.89	10.27	1	36.3
28	11	59	18.56	5.508	3	10	36.8	61.21	9.925 4635	3179.8	3.96	10.45	1	34.7
29	12	1	23.92	4.933	3	34	13.1	56.75	9.917 7793	3222.8	4.03	10.63	1	32.8
30	12	3	15.06	4.323	3	55	57.9	51.92	9.909 9995	3259.1	4.11	10.83	1	30.7
Sept. 31	12	4	51.13	+ 3.677	-4	15	41.9	- 46.68	9.902 1424	-3287.0	4.18	11.02	1	28.3
1	12	6	11.24	2.992	4	33	15.2	41.01	9.894 2304	3304.3	4.26	11.23	1	25.7
2	12	7	14.44	2.268	4	48	26.9	34.88	9.886 2921	3306.7	4.34	11.43	1	22.8
3	12	7	59.78	1.504	5	1	5.7	28.26	9.878 3611	3297.6	4.42	11.64	1	19.6
4	12	8	26.33	+ 0.702	5	10	59.6	21.14	9.870 4789	3267.6	4.50	11.86	1	16.1
5	12	8	33.18	- 0.137	-5	17	56.3	- 13.49	9.862 6949	-3215.0	4.58	12.07	1	12.3
6	12	8	19.51	1.007	5	21	42.9	- 5.31	9.855 0681	3126.1	4.67	12.29	1	8.1
7	12	7	44.61	1.905	5	22	7.2	+ 3.38	9.847 6663	3026.5	4.74	12.50	1	3.6
8	12	6	47.95	2.819	5	18	56.8	12.56	9.840 5690	2881.7	4.82	12.70	0	58.7
9	12	5	29.28	3.737	5	12	1.2	22.14	9.833 8662	2996.9	4.90	12.90	0	53.4
10	12	3	48.64	- 4.646	-5	1	11.3	+ 22.06	9.827 6596	-2467.7	4.97	13.09	0	47.8
11	12	1	46.49	5.526	4	46	20.9	42.16	9.822 0598	2190.4	5.03	13.26	0	41.9
12	11	59	23.80	6.354	4	27	27.4	52.28	9.817 1868	1861.7	5.09	13.41	0	35.6
13	11	56	42.11	7.105	4	4	33.3	62.17	9.813 1660	1480.1	5.13	13.53	0	28.9
14	11	53	43.60	7.751	3	37	47.1	71.58	9.810 1247	1046.7	5.17	13.63	0	22.1
15	11	50	31.12	- 8.264	-3	7	23.9	+ 80.20	9.808 1868	- 561.1	5.20	13.69	0	14.9
16	11	47	8.20	8.617	2	33	46.4	87.71	9.807 4673	- 31.6	5.20	13.71	0	7.7
17	11	43	39.01	8.783	1	57	25.3	93.79	9.808 0648	+ 534.9	5.20	13.69	0	0.3
18	11	40	8.25	8.745	1	18	58.1	98.16	9.810 0558	1127.5	5.17	13.63	23	45.5
19	11	36	41.03	8.488	-0	39	9.2	100.56	9.813 4872	1733.0	5.13	13.52	23	38.3
20	11	33	22.69	- 8.005	+0	1	12.2	+100.86	9.818 3729	+2337.0	5.08	13.37	23	31.3
21	11	30	18.52	7.306	0	41	14.6	98.97	9.824 6911	2924.0	5.00	13.18	23	24.6
22	11	27	33.64	6.401	1	20	5.4	94.92	9.832 3827	3479.2	4.92	12.95	23	18.3
23	11	25	12.72	5.314	1	56	54.5	88.85	9.841 3553	3989.5	4.82	12.68	23	12.5
24	11	23	19.82	4.071	2	30	55.3	80.94	9.851 4868	4443.3	4.71	12.39	23	7.2
25	11	21	58.26	- 2.708	+3	1	27.1	+ 71.47	9.862 6313	+4832.5	4.58	12.07	23	2.5
26	11	21	10.53	- 1.259	3	27	56.0	60.75	9.874 6266	5151.7	4.46	11.74	22	58.3
27	11	20	58.24	+ 0.240	3	49	55.6	49.08	9.887 3014	5398.4	4.33	11.41	22	54.8
28	11	21	22.16	1.753	4	7	6.8	36.78	9.900 4812	5573.0	4.20	11.07	22	51.8
29	11	22	22.26	3.250	4	19	18.3	24.14	9.913 9963	5678.2	4.07	10.73	22	49.4
30	11	23	57.80	+ 4.702	+4	26	25.1	+ 11.44	9.927 6845	+5718.2	3.95	10.39	22	47.6
Oct. 1	11	26	7.39	+ 6.085	+4	28	28.6	- 1.10	9.941 3965	+5699.2	3.82	10.07	22	46.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.	Noon.	Noon.		Noon.	Noon.	Noon.							Noon.
	h	m	s	s	°	'	"	"					h	m
Oct.	1	11 26	7.39	+ 6.085	+ 4 28	28.6	- 1.10	9.941 3965	+5609.2	3.82	10.07	22 46.3		
	2	11 28	49.18	7.382	4 25	35.4	13.26	9.954 9986	5627.8	3.70	9.76	22 45.6		
	3	11 32	0.93	8.579	4 17	56.6	24.88	9.968 3740	5511.4	3.59	9.46	22 45.3		
	4	11 35	40.12	9.668	4 5	46.5	35.84	9.981 4232	5357.4	3.48	9.18	22 45.4		
	5	11 39	44.09	10.644	3 49	22.5	46.02	9.994 0658	5173.6	3.39	8.92	22 45.8		
	6	11 44	10.12	+11.507	+ 3 29	3.9	- 55.39	0.006 2379	+4966.5	3.29	8.67	22 46.6		
	7	11 48	55.53	12.259	3 5	10.9	63.88	0.017 8917	4742.9	3.21	8.44	22 47.7		
	8	11 53	57.72	12.907	2 38	4.8	71.49	0.028 9951	4508.6	3.12	8.23	22 49.0		
	9	11 59	14.28	13.457	2 8	6.3	78.24	0.039 5283	4268.5	3.05	8.03	22 50.6		
	10	12 4	42.96	13.919	1 35	36.2	84.14	0.049 4825	4026.7	2.98	7.85	22 52.3		
	11	12 10	21.75	+14.301	+ 1 0	54.1	- 89.24	0.058 8582	+3787.1	2.91	7.68	22 54.1		
	12	12 16	8.83	14.610	+ 0 24	18.8	93.58	0.067 6638	3552.0	2.86	7.53	22 56.1		
	13	12 22	2.63	14.862	- 0 13	52.3	97.28	0.075 9128	3328.4	2.81	7.39	22 58.1		
	14	12 28	1.81	15.061	0 53	23.2	100.24	0.083 6227	3108.1	2.76	7.26	23 0.2		
	15	12 34	5.18	15.214	1 33	59.2	102.66	0.090 8150	2892.0	2.72	7.14	23 2.4		
	16	12 40	11.79	+15.331	- 2 15	26.9	-104.56	0.097 5119	+2690.3	2.67	7.03	23 4.6		
	17	12 46	20.83	15.417	2 57	34.5	105.99	0.103 7366	2498.8	2.63	6.93	23 6.8		
	18	12 52	31.63	15.479	3 40	11.2	107.00	0.109 5141	2317.2	2.60	6.84	23 9.1		
	19	12 58	43.66	15.521	4 23	7.5	107.64	0.114 8671	2145.2	2.56	6.75	23 11.4		
	20	13 4	56.51	15.547	5 6	15.0	107.94	0.119 8189	1982.8	2.53	6.68	23 13.6		
	21	13 11	9.84	+15.562	- 5 49	26.1	-107.94	0.124 3916	+1839.3	2.50	6.61	23 15.9		
	22	13 17	23.42	15.568	6 32	34.3	107.69	0.128 6062	1684.2	2.48	6.54	23 18.2		
	23	13 23	37.07	15.568	7 15	33.6	107.21	0.132 4820	1547.1	2.46	6.49	23 20.5		
	24	13 29	50.67	15.565	7 58	18.9	106.53	0.136 0384	1417.6	2.44	6.43	23 22.8		
	25	13 36	4.15	15.559	8 40	45.7	105.67	0.139 2919	1294.8	2.43	6.39	23 25.1		
	26	13 42	17.49	+15.552	- 9 22	49.8	-104.65	0.142 2585	+1178.4	2.41	6.34	23 27.4		
	27	13 48	30.66	15.546	10 4	27.6	103.48	0.144 9528	1067.8	2.39	6.30	23 29.6		
	28	13 54	43.72	15.542	10 45	36.0	102.19	0.147 3883	962.6	2.38	6.27	23 31.9		
	29	14 0	56.69	15.540	11 26	12.0	100.79	0.149 5771	862.2	2.37	6.24	23 34.2		
	30	14 7	9.65	15.541	12 6	13.0	99.28	0.151 5302	766.1	2.35	6.21	23 36.5		
	31	14 13	22.67	+15.545	-12 45	36.7	- 97.68	0.153 2575	+ 674.0	2.34	6.18	23 38.8		
Nov.	1	14 19	35.83	15.553	13 24	20.9	95.99	0.154 7682	585.4	2.34	6.16	23 41.0		
	2	14 25	49.23	15.564	14 2	23.5	94.22	0.156 0700	500.0	2.33	6.14	23 43.3		
	3	14 32	2.95	15.580	14 39	42.7	92.37	0.157 1702	417.2	2.33	6.13	23 45.6		
	4	14 38	17.10	15.600	15 16	16.9	90.46	0.158 0748	337.1	2.32	6.11	23 47.9		
	5	14 44	31.76	+15.623	-15 52	4.3	- 88.48	0.158 7899	+ 259.1	2.32	6.10	23 50.2		
	6	14 50	47.04	15.651	16 27	3.4	86.44	0.159 3197	182.7	2.32	6.10	23 52.6		
	7	14 57	3.03	15.682	17 1	12.7	84.33	0.159 6683	108.0	2.32	6.09	23 54.9		
	8	15 3	19.81	15.717	17 34	30.8	82.17	0.159 8394	+ 34.8	2.32	6.09	23 57.3		
	9	15 9	37.47	15.755	18 6	56.2	79.94	0.159 8359	- 37.7	2.32	6.09	23 59.6		
	10	15 15	56.07	+15.796	-18 38	27.6	- 77.67	0.159 6593	- 109.3	2.32	6.09	...		
	11	15 22	15.71	15.841	19 9	3.7	75.33	0.159 3118	180.3	2.32	6.10	0 2.0		
	12	15 28	36.44	15.887	19 38	42.9	72.93	0.158 7942	250.9	2.32	6.10	0 4.4		
	13	15 34	58.32	15.936	20 7	24.1	70.49	0.158 1074	321.5	2.32	6.11	0 6.9		
	14	15 41	21.38	15.986	20 35	6.0	67.99	0.157 2508	392.3	2.33	6.13	0 9.3		
	15	15 47	45.67	+16.038	-21 1	47.0	- 65.42	0.156 2242	- 463.3	2.34	6.14	0 11.8		
	16	15 54	11.21	+16.090	-21 27	25.8	- 62.80	0.155 0265	- 534.9	2.34	6.16	0 14.3		

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"					h	m
Nov. 16	15	54	11.21	+16.090	-21	27	25.8	-62.80	0.155 0265	-534.9	2.34	6.16	0	14.3
17	16	0	38.01	16.143	21	52	1.2	60.14	0.153 6561	607.3	2.35	6.18	0	16.8
18	16	7	6.08	16.195	22	15	31.9	57.41	0.152 1107	680.7	2.35	6.20	0	19.3
19	16	13	35.38	16.246	22	37	56.2	54.61	0.150 3880	755.1	2.36	6.22	0	21.9
20	16	20	5.90	16.296	22	59	12.9	51.77	0.148 4848	831.2	2.37	6.25	0	24.4
21	16	26	37.59	+16.344	-23	19	20.7	-48.86	0.146 3970	-908.8	2.38	6.28	0	27.0
22	16	33	10.37	16.388	23	38	17.9	45.89	0.144 1209	988.3	2.39	6.31	0	29.6
23	16	39	44.17	16.428	23	56	3.2	42.87	0.141 6515	1069.9	2.41	6.35	0	32.3
24	16	46	18.87	16.463	24	12	35.3	39.79	0.138 9834	1154.0	2.43	6.39	0	34.9
25	16	52	54.35	16.492	24	27	52.8	36.65	0.136 1100	1240.8	2.44	6.43	0	37.6
26	16	59	30.45	+16.515	-24	41	54.0	-33.44	0.133 0253	-1330.4	2.46	6.48	0	40.2
27	17	6	6.99	16.529	24	54	37.7	30.19	0.129 7214	1423.4	2.48	6.53	0	42.9
28	17	12	43.74	16.532	25	6	2.6	26.87	0.126 1902	1520.0	2.49	6.58	0	45.6
29	17	19	20.45	16.525	25	16	7.1	23.50	0.122 4225	1620.4	2.52	6.64	0	48.2
30	17	25	56.84	16.505	25	24	50.3	20.08	0.118 4087	1725.1	2.54	6.70	0	50.9
Dec. 1	17	32	32.57	+16.470	-25	32	10.6	-16.60	0.114 1381	-1834.5	2.57	6.77	0	53.6
2	17	39	7.24	16.417	25	38	7.0	13.09	0.109 5991	1948.9	2.60	6.84	0	56.2
3	17	45	40.43	16.345	25	42	38.5	9.53	0.104 7794	2068.5	2.62	6.91	0	58.8
4	17	52	11.61	16.260	25	45	44.1	5.94	0.099 6659	2193.9	2.66	6.99	1	1.4
5	17	58	40.24	16.130	25	47	23.2	-2.32	0.094 2438	2325.4	2.69	7.08	1	3.9
6	18	5	5.63	+15.981	-25	47	35.1	+1.32	0.088 4990	-2463.2	2.73	7.18	1	6.4
7	18	11	27.07	15.799	25	46	19.6	4.97	0.082 4150	2607.9	2.77	7.28	1	8.8
8	18	17	43.70	15.580	25	43	36.6	8.61	0.075 9754	2750.6	2.81	7.39	1	11.2
9	18	23	54.57	15.319	25	39	26.5	12.23	0.069 1633	2918.5	2.85	7.50	1	13.4
10	18	29	58.60	15.009	25	33	50.0	15.81	0.061 9610	3084.6	2.89	7.63	1	15.5
11	18	35	54.55	+14.645	-25	26	48.3	+19.32	0.054 3512	-3258.1	2.94	7.76	1	17.5
12	18	41	41.05	14.219	25	18	23.2	22.75	0.046 3164	3438.6	3.00	7.91	1	19.3
13	18	47	16.52	13.724	25	8	37.2	26.07	0.037 8408	3625.5	3.06	8.06	1	21.0
14	18	52	39.19	13.151	24	57	33.2	29.24	0.028 9096	3817.9	3.12	8.23	1	22.4
15	18	57	47.05	12.489	24	45	15.3	32.21	0.019 5114	4014.6	3.19	8.41	1	23.6
16	19	2	37.88	+11.729	-24	31	48.7	+34.96	0.009 6378	-4213.6	3.26	8.61	1	24.4
17	19	7	9.17	10.859	24	17	19.2	37.44	9.999 2866	4412.0	3.34	8.81	1	25.0
18	19	11	18.16	9.869	24	1	54.1	39.60	9.988 4635	4606.1	3.43	9.04	1	25.2
19	19	15	1.82	8.747	23	45	41.5	41.38	9.977 1843	4791.2	3.52	9.27	1	24.9
20	19	18	16.86	7.482	23	28	51.2	42.74	9.965 4778	4961.0	3.62	9.53	1	24.2
21	19	20	59.78	+6.069	-23	11	33.8	+43.62	9.953 3897	-5107.9	3.72	9.80	1	22.9
22	19	23	6.94	4.502	22	54	1.3	44.00	9.940 9859	5222.4	3.82	10.08	1	21.1
23	19	24	34.68	2.784	22	36	26.1	43.84	9.928 3572	5293.3	3.94	10.38	1	18.6
24	19	25	19.44	+0.924	22	19	1.4	43.12	9.915 6228	5308.2	4.06	10.69	1	15.4
25	19	25	18.07	-1.067	22	2	0.6	41.86	9.902 9333	5253.6	4.17	11.00	1	11.4
26	19	24	28.02	-3.125	-21	45	36.2	+40.07	9.890 4724	-5115.5	4.30	11.32	1	6.6
27	19	22	47.77	5.231	21	30	0.1	37.86	9.878 4563	4880.9	4.42	11.64	1	0.9
28	19	20	17.14	7.310	21	15	22.0	35.25	9.867 1291	4540.2	4.54	11.95	0	54.5
29	19	16	57.72	9.283	21	1	50.3	32.35	9.856 7527	4088.1	4.65	12.24	0	47.2
30	19	12	53.11	11.063	20	49	31.0	29.24	9.847 5942	3526.1	4.74	12.50	0	39.2
31	19	8	9.10	-12.551	-20	38	28.0	+25.99	9.839 9078	-2863.9	4.83	12.72	0	30.6
32	19	2	53.57	....	-20	28	44.2	....	9.833 9126	....	4.90	12.90	0	21.4

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Jan.	1	12 18 53.7	5 10 27.6	-12 6.9	-4 2 0.9	+31 4.4	9.531 6416	-66697
	2	17 33 55.3	5 19 35.2	11 7.2	3 29 29.8	33 56.8	9.525 0804	64402
	3	22 58 1.9	5 28 36.3	9 42.2	2 54 10.3	36 40.4	9.518 7880	61306
	4	28 31 3.1	5 37 23.0	7 53.3	2 16 13.8	39 9.8	9.512 8476	57359
	5	34 12 40.0	5 45 46.0	5 43.0	1 35 57.1	41 19.8	9.507 3454	52538
	6	40 2 23.9	5 53 35.4	-3 15.5	-0 53 42.6	+43 4.4	9.502 3694	-46639
	7	45 59 36.3	6 0 41.0	-0 36.6	-0 9 58.8	44 17.6	9.498 0059	40294
	8	52 3 27.8	6 6 51.9	+2 6.9	+0 34 40.5	44 54.5	9.494 3367	32967
	9	58 12 58.4	6 11 57.7	4 47.0	1 19 36.7	44 51.0	9.491 4351	24964
	10	64 26 58.4	6 15 49.2	7 15.5	2 4 7.9	44 4.1	9.489 3616	16431
	11	70 44 9.3	6 18 18.4	+9 24.2	+2 47 30.1	+42 33.1	9.488 1611	-7532
	12	77 3 5.9	6 19 19.9	11 6.1	3 28 59.8	40 19.4	9.487 8608	+1538
	13	83 22 18.8	6 18 50.7	12 15.6	4 7 55.9	37 26.6	9.488 4674	10571
	14	89 40 17.0	6 16 50.6	12 49.2	4 43 41.6	33 59.6	9.489 9671	19367
	15	95 55 30.8	6 13 22.8	12 45.9	5 15 46.1	30 5.4	9.492 3266	27740
	16	102 6 35.2	6 8 33.0	+12 7.0	+5 43 45.9	+25 51.6	9.495 4954	+35526
	17	108 12 12.0	6 2 29.1	10 55.7	6 7 25.5	21 26.3	9.499 4080	42598
	18	114 11 12.1	5 55 21.4	9 17.1	6 26 37.3	16 57.2	9.503 9881	48864
	19	120 2 37.2	5 47 21.0	7 17.3	6 41 21.0	12 31.2	9.509 1519	54268
	20	125 45 40.2	5 38 39.2	5 2.8	6 51 42.7	8 14.2	9.514 8122	58792
	21	131 19 45.7	5 29 27.8	+2 40.5	+6 57 53.9	+4 10.8	9.520 8812	+62445
	22	136 44 29.5	5 19 57.5	+0 16.3	7 0 10.1	+0 24.6	9.527 2734	65266
	23	141 59 37.7	5 10 18.0	-2 4.2	6 58 49.5	-3 2.5	9.533 9082	67304
	24	147 5 5.4	5 0 38.0	4 16.6	6 54 11.9	6 9.4	9.540 7103	68624
	25	152 0 55.8	4 51 4.4	6 17.1	6 46 37.7	8 55.6	9.547 6114	69297
	26	156 47 18.5	4 41 43.4	-8 3.4	+6 36 27.3	-11 22.0	9.554 5506	+69398
	27	161 24 28.4	4 32 39.5	9 33.6	6 24 0.2	13 29.2	9.561 4743	69996
	28	165 52 44.4	4 23 56.1	10 46.8	6 9 35.0	15 18.4	9.568 3355	68163
	29	170 12 28.2	4 15 35.4	11 42.9	5 53 28.8	16 51.3	9.575 0947	66962
	30	174 24 3.6	4 7 39.6	12 22.0	5 35 57.3	18 9.4	9.581 7176	65448
	31	178 27 55.9	4 0 9.2	-12 44.8	+5 17 14.4	-19 14.2	9.588 1759	+63677
Feb.	1	182 24 30.7	3 53 4.8	12 52.3	4 57 33.0	20 6.9	9.594 4460	61094
	2	186 14 14.0	3 46 26.2	12 45.6	4 37 4.1	20 49.8	9.600 5088	59535
	3	189 57 31.5	3 40 13.0	12 26.0	4 15 57.5	21 22.4	9.606 3483	57235
	4	193 34 48.3	3 34 24.8	11 54.7	3 54 21.9	21 47.6	9.611 9522	54826
	5	197 6 29.2	3 29 0.8	-11 13.3	+3 32 24.7	-22 5.8	9.617 3107	+52332
	6	200 32 57.8	3 24 0.2	10 23.0	3 10 12.3	22 18.0	9.622 4163	49770
	7	203 54 37.0	3 19 21.8	9 25.1	2 47 50.4	22 25.0	9.627 2632	47162
	8	207 11 48.6	3 15 5.0	8 21.0	2 25 23.9	22 27.4	9.631 8475	44519
	9	210 24 53.8	3 11 8.7	7 11.7	2 2 56.9	22 26.0	9.636 1662	41852
	10	213 34 12.5	3 7 31.9	-5 58.5	+1 40 33.0	-22 21.2	9.640 2175	+39172
	11	216 40 3.8	3 4 13.8	4 42.3	1 18 15.4	22 13.6	9.644 0004	36496
	12	219 42 46.1	3 1 13.7	3 24.2	0 56 6.6	22 3.6	9.647 5145	33796
	13	222 42 36.9	2 58 30.6	2 5.0	0 34 9.0	21 51.2	9.650 7597	31110
	14	225 39 52.8	2 56 3.9	-0 45.5	+0 12 24.7	21 37.1	9.653 7368	28432
	15	228 34 49.9	2 53 52.8	+0 33.3	-0 9 4.6	-21 21.2	9.656 4464	+25760
	16	231 27 43.4	2 51 56.8	+1 50.9	-0 30 17.3	-21 4.0	9.658 8892	+23096

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Feb.	16	231 27 43.4	2 51 56.8	+ 1 50.9	-0 30 17.3	-21 4.0	9.658 8892	+23098
	17	234 18 48.3	2 50 15.4	3 6.6	0 51 12.1	20 45.4	9.661 0663	20446
	18	237 8 18.8	2 48 48.0	4 19.7	1 11 47.6	20 25.4	9.662 9788	17905
	19	239 56 28.8	2 47 34.2	5 29.8	1 32 2.6	20 4.5	9.664 6276	15173
	20	242 43 31.6	2 46 33.6	6 36.2	1 51 56.2	19 42.4	9.666 0137	12550
	21	245 29 40.4	2 45 46.0	+ 7 38.5	-2 11 27.1	-19 19.2	9.667 1379	+ 9935
	22	248 15 7.9	2 45 11.0	8 36.3	2 30 34.4	18 55.2	9.668 0009	7326
	23	251 0 6.7	2 44 48.6	9 29.1	2 49 17.1	18 30.0	9.668 6033	4722
	24	253 44 49.3	2 44 38.6	10 16.5	3 7 34.1	18 3.8	9.668 9454	+ 2120
	25	256 29 27.9	2 44 40.6	10 58.3	3 25 24.2	17 36.3	9.669 0274	- 490
	26	259 14 14.7	2 44 55.0	+11 34.0	-3 42 46.3	-17 7.7	9.668 8495	- 3080
	27	261 59 22.0	2 45 21.6	12 3.3	3 59 39.2	16 37.8	9.668 4114	5684
	28	264 45 1.9	2 46 0.4	12 26.0	4 16 1.5	16 6.6	9.667 7127	8289
Mar.	1	267 31 26.9	2 46 51.6	12 41.9	4 31 51.9	15 33.8	9.666 7534	10900
	2	270 18 49.2	2 47 55.2	12 50.6	4 47 8.6	14 59.4	9.665 5325	13518
	3	273 7 21.7	2 49 11.8	+12 52.0	-5 1 50.0	-14 23.2	9.664 0494	-16145
	4	275 57 17.2	2 50 41.4	12 45.8	5 15 54.2	13 44.8	9.662 3032	18780
	5	278 48 48.8	2 52 24.2	12 32.1	5 29 19.0	13 4.4	9.660 2931	21425
	6	281 42 10.1	2 54 20.7	12 10.6	5 42 2.2	12 21.5	9.658 0179	24080
	7	284 37 34.9	2 56 31.3	11 41.4	5 54 1.1	11 35.9	9.655 4767	26746
	8	287 35 17.6	2 58 56.6	+11 4.3	-6 5 13.0	-10 47.3	9.652 6684	-29420
	9	290 35 33.0	3 1 36.8	10 19.6	6 15 34.6	9 55.4	9.649 5925	32102
	10	293 38 36.4	3 4 32.7	9 27.2	6 25 2.7	9 0.0	9.646 2479	34790
	11	296 44 43.8	3 7 44.8	8 27.4	6 33 33.4	8 0.6	9.642 6345	37478
	12	299 54 11.7	3 11 13.8	7 20.4	6 41 2.5	6 56.8	9.638 7525	40162
	13	303 7 17.3	3 15 0.3	+ 6 6.8	-6 47 25.5	- 5 48.3	9.634 6025	-42838
	14	306 24 18.4	3 19 5.1	4 46.9	6 52 37.4	4 24.6	9.630 1855	45498
	15	309 45 33.8	3 23 28.8	3 21.5	6 56 32.8	3 15.2	9.625 5038	48130
	16	313 11 22.6	3 28 12.2	1 51.3	6 59 5.8	1 49.6	9.620 5608	50722
	17	316 42 4.9	3 33 15.8	+ 0 17.4	7 0 9.9	- 0 17.5	9.615 3612	53260
	18	320 18 1.3	3 38 40.6	- 1 19.1	-6 59 38.4	+ 1 21.8	9.609 9111	-55727
	19	323 59 33.3	3 44 27.0	2 56.8	6 57 23.9	3 8.5	9.604 2190	58098
	20	327 47 2.6	3 50 38.3	4 34.2	6 53 18.7	5 3.4	9.598 2956	60348
	21	331 40 51.4	3 57 6.2	6 9.2	6 47 14.4	7 6.5	9.592 1544	62447
	22	335 41 22.4	4 3 59.6	7 39.9	6 39 2.8	9 18.4	9.585 8125	64358
	23	339 48 58.0	4 11 15.4	- 9 4.0	-6 28 35.0	+11 38.7	9.579 2905	-66041
	24	344 4 0.5	4 18 53.1	10 18.9	6 15 42.6	14 7.6	9.572 6137	67444
	25	348 26 51.2	4 26 51.8	11 21.9	6 0 17.1	16 44.8	9.565 8129	68514
	26	352 57 50.7	4 35 10.1	12 10.4	5 42 10.6	19 29.4	9.558 9239	69197
	27	357 37 17.3	4 43 45.8	12 41.4	5 21 16.3	22 20.2	9.551 9888	69422
	28	2 25 27.2	4 52 36.2	-12 52.3	-4 57 28.7	+25 15.5	9.545 0572	-69118
	29	7 22 33.2	5 1 37.3	12 41.0	4 30 44.5	28 13.0	9.538 1854	68212
	30	12 28 43.8	5 10 44.4	12 5.5	4 1 2.8	31 9.8	9.531 4373	66634
	31	17 44 2.2	5 19 51.9	11 4.9	3 28 26.4	34 2.0	9.524 8834	64314
Apr.	1	23 8 25.4	5 28 52.8	9 39.2	2 53 1.8	36 45.2	9.518 6012	61194
	2	28 41 42.7	5 37 38.6	- 7 49.5	-2 15 0.7	+39 14.2	9.512 6731	-57222
	3	34 23 34.8	5 46 0.8	- 5 38.7	-1 34 40.0	+41 23.4	9.507 1862	-52370

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Apr.	1	23 8 25.4	5 28 52.8	- 9 39.2	-2 53 1.8	+36 45.2	9.518 6012	-61194
	2	28 41 42.7	5 37 38.6	7 49.5	2 15 0.7	39 14.2	9.512 6731	57222
	3	34 23 34.8	5 46 0.8	5 38.7	1 34 40.0	41 23.4	9.507 1862	52370
	4	40 13 33.0	5 53 49.1	3 10.8	0 52 22.4	43 7.1	9.502 2282	46645
	5	46 10 58.2	6 0 53.0	- 0 31.6	-0 8 36.3	44 19.4	9.497 8854	40075
	6	52 15 0.8	6 7 2.0	+ 2 11.9	+0 36 4.1	+44 55.0	9.494 2393	-32728
	7	58 24 40.4	6 12 5.6	4 51.8	1 21 0.1	44 50.0	9.491 3624	24707
	8	64 38 47.1	6 15 54.6	7 19.8	2 5 29.7	44 1.8	9.489 3156	16157
	9	70 56 2.1	6 18 21.2	9 27.8	2 48 49.0	42 29.6	9.488 1429	- 7252
	10	77 15 0.1	6 19 20.0	11 8.7	3 30 14.6	40 14.8	9.487 8708	+ 1818
	11	83 34 11.7	6 18 48.0	+12 17.1	+4 9 5.3	+37 20.6	9.488 5052	+10847
	12	89 52 5.7	6 16 45.0	12 49.7	4 44 44.5	33 52.8	9.490 0321	19633
	13	96 7 12.6	6 13 14.6	12 45.3	5 16 41.7	29 57.8	9.492 4174	27988
	14	102 18 7.6	6 8 22.3	12 5.2	5 44 33.7	25 43.6	9.495 6101	35755
	15	108 23 32.7	6 2 16.5	10 53.1	6 8 5.1	21 18.0	9.499 5443	42801
	16	114 22 19.3	5 55 7.0	+ 9 13.7	+6 27 8.6	+16 48.9	9.504 1433	+49040
	17	120 13 29.1	5 47 5.0	7 13.3	6 41 44.0	12 23.0	9.509 3235	54418
	18	125 56 15.7	5 38 22.3	4 58.6	6 51 57.8	8 6.4	9.514 9974	58914
	19	131 30 3.9	5 29 10.2	2 36.0	6 58 1.5	4 3.6	9.521 0773	62542
	20	136 54 29.9	5 19 39.6	+ 0 11.9	7 0 10.8	+ 0 17.9	9.527 4780	65336
	21	142 9 20.0	5 9 59.9	- 2 8.4	+6 58 43.8	- 3 8.6	9.534 1185	+67350
	22	147 14 29.6	5 0 20.0	4 20.4	6 54 0.5	6 14.7	9.540 9243	68652
	23	152 10 2.2	4 50 46.8	6 20.6	6 46 21.2	9 0.4	9.547 8272	69305
	24	156 56 7.5	4 41 26.3	8 6.4	6 36 6.3	11 26.2	9.554 7663	69388
	25	161 33 0.6	4 32 22.0	9 36.1	6 23 35.3	13 32.7	9.561 6883	68974
	26	166 1 0.4	4 23 40.2	-10 48.8	+6 9 6.8	-15 21.5	9.568 5468	+68130
	27	170 20 28.7	4 15 20.5	11 44.4	5 52 57.7	16 54.0	9.575 3020	66917
	28	174 31 49.6	4 7 25.4	12 23.0	5 35 23.8	18 11.6	9.581 9200	65396
	29	178 35 28.0	3 59 55.8	12 45.3	5 16 39.0	19 15.9	9.588 3727	63617
	30	182 31 49.7	3 52 52.1	12 52.3	4 56 56.0	20 8.4	9.594 6364	61627
May	1	186 21 20.8	3 46 14.3	-12 45.2	+4 36 25.8	-20 50.4	9.600 6923	+59464
	2	190 4 26.8	3 40 2.0	12 25.2	4 15 18.2	21 23.4	9.606 5246	57162
	3	193 41 33.0	3 34 14.6	11 53.6	3 53 41.8	21 48.2	9.612 1210	54749
	4	197 13 3.9	3 28 51.2	11 11.9	3 31 44.0	22 6.2	9.617 4716	52252
	5	200 39 23.3	3 23 51.4	10 21.3	3 9 31.3	22 18.2	9.622 5692	49690
	6	204 0 54.0	3 19 12.8	- 9 23.2	+2 47 9.2	-22 25.1	9.627 4080	+47079
	7	207 17 57.9	3 14 57.6	8 18.9	2 24 42.6	22 27.4	9.631 9839	44436
	8	210 30 55.9	3 11 1.8	7 9.5	2 2 15.6	22 25.9	9.636 2944	41769
	9	213 40 8.0	3 7 26.6	5 56.2	1 39 51.9	22 21.0	9.640 3372	39068
	10	216 45 53.3	3 4 8.1	4 39.9	1 17 34.4	22 13.4	9.644 1117	36400
	11	219 48 30.2	3 1 8.5	- 3 21.7	+0 55 25.9	-22 3.2	9.647 6173	+33713
	12	222 48 16.0	2 58 26.0	2 2.5	0 33 28.7	21 50.8	9.650 8544	31028
	13	225 45 27.5	2 55 59.7	- 0 43.1	+0 11 44.9	21 36.6	9.653 8230	28348
	14	228 40 20.6	2 53 49.1	+ 0 35.7	-0 9 44.0	21 20.8	9.656 5244	25679
	15	231 33 10.7	2 51 53.6	1 53.3	0 30 56.2	21 3.4	9.658 9591	23018
	16	234 24 12.6	2 50 12.6	+ 3 8.9	-0 51 50.3	-20 44.7	9.661 1283	+20367
	17	237 13 40.5	2 48 45.4	+ 4 21.9	-1 12 25.2	-20 24.9	9.663 0328	+17726

FOR GREENWICH MEAN NOON

Date.	Helio-centric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Helio-centric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
	° ' "	° ' "	' "	° ' "	' "		
May 17	237 13 40.5	2 48 45.4	+ 4 21.9	-1 12 25.2	-20 24.9	9.663 0328	+17726
18	240 1 48.2	2 47 32.1	5 31.9	1 32 39.7	20 3.8	9.664 6736	15094
19	242 48 49.3	2 46 32.0	6 38.2	1 52 32.5	19 41.7	9.666 0518	12472
20	245 34 56.6	2 45 44.8	7 40.4	2 12 2.8	19 18.6	9.667 1681	9856
21	248 20 23.1	2 45 10.2	8 38.0	2 31 9.4	18 54.4	9.668 0231	7246
22	251 5 21.3	2 44 48.2	+ 9 30.6	-2 49 51.3	-18 29.2	9.668 6176	+ 4642
23	253 50 3.6	2 44 38.5	10 17.9	3 8 7.4	18 2.9	9.668 9517	+ 2040
24	256 34 42.4	2 44 41.0	10 59.5	3 25 56.7	17 35.4	9.669 0257	- 559
25	259 19 29.7	2 44 55.6	11 35.0	3 43 17.9	17 6.8	9.668 8399	3159
26	262 4 37.8	2 45 22.6	12 4.1	4 0 9.9	16 37.0	9.668 3938	5762
27	264 50 19.0	2 46 1.8	+12 26.6	-4 16 31.3	-16 5.6	9.667 6874	- 8367
28	267 36 45.5	2 46 53.4	12 42.2	4 32 20.6	15 32.8	9.666 7202	10979
29	270 24 9.9	2 47 57.4	12 50.7	4 47 36.3	14 58.3	9.665 4914	13596
30	273 12 44.7	2 49 14.3	12 51.9	5 2 16.6	14 22.0	9.664 0005	16223
31	276 2 42.9	2 50 44.3	12 45.5	5 16 19.6	13 43.7	9.662 2465	18960
June 1	278 54 17.7	2 52 27.6	+12 31.6	-5 29 43.2	-13 3.1	9.660 2283	-21505
2	281 47 42.5	2 54 24.4	12 9.8	5 42 25.0	12 20.1	9.657 9452	24180
3	284 43 11.3	2 56 36.6	11 40.4	5 54 22.5	11 34.4	9.655 3960	26826
4	287 40 58.4	2 59 1.2	11 3.1	6 5 32.9	10 45.8	9.652 5797	29500
5	290 41 18.6	3 1 41.9	10 18.1	6 15 53.0	9 63.8	9.649 4957	32181
6	293 44 27.4	3 4 38.3	+ 9 25.4	-6 25 19.3	- 8 58.2	9.646 1433	-34870
7	296 50 40.6	3 7 50.9	8 25.4	6 33 48.1	7 58.6	9.642 5218	37558
8	300 0 14.8	3 11 20.4	7 18.3	6 41 15.2	6 54.8	9.638 6318	40243
9	303 13 27.2	3 15 7.4	6 4.4	6 47 36.1	5 46.2	9.634 4735	42918
10	306 30 35.7	3 19 12.6	4 44.4	6 52 45.8	4 32.2	9.630 0487	45676
11	309 51 59.0	3 23 37.1	+ 3 18.8	-6 56 38.7	- 3 12.6	9.625 3591	-48208
12	313 17 56.4	3 28 21.0	1 48.5	6 59 9.1	1 47.0	9.620 4084	50799
13	316 48 47.8	3 33 25.4	+ 0 14.5	7 0 10.4	- 0 14.6	9.615 2011	53336
14	320 24 54.1	3 38 50.7	- 1 22.1	6 59 35.9	+ 1 24.9	9.609 7437	55799
15	324 6 36.4	3 44 37.6	2 59.8	6 57 18.1	3 12.0	9.604 0445	58168
16	327 54 16.7	3 50 46.7	- 4 37.1	-6 53 9.3	+ 5 7.0	9.598 1143	-60414
17	331 48 17.3	3 57 18.2	6 12.1	6 47 1.3	7 10.4	9.591 9668	62606
18	335 49 0.7	4 4 12.3	7 42.6	6 38 45.6	9 22.4	9.585 6191	64412
19	339 56 49.4	4 11 28.8	9 6.5	6 28 13.6	11 43.1	9.579 0920	66086
20	344 12 5.6	4 19 7.2	10 21.0	6 15 16.6	14 12.3	9.572 4111	67482
21	348 35 10.7	4 27 6.4	-11 23.7	-5 59 46.3	+16 49.7	9.565 6068	-68542
22	353 6 25.0	4 35 25.4	12 11.6	5 41 34.8	19 34.5	9.558 7157	69210
23	357 46 7.2	4 44 1.6	12 42.0	5 20 35.3	22 25.5	9.551 7800	69420
24	2 34 33.0	4 52 52.2	12 52.3	4 56 42.4	25 20.8	9.544 8493	69100
25	7 31 55.3	5 1 53.6	12 40.2	4 29 52.8	28 18.5	9.537 9802	68176
26	12 38 22.3	5 11 0.9	-12 4.0	-4 0 5.8	+31 15.1	9.531 2366	-66576
27	17 53 57.2	5 20 8.3	11 2.6	3 27 24.1	34 7.2	9.524 6896	64235
28	23 18 36.6	5 29 8.7	9 36.1	2 51 54.6	36 50.0	9.518 4165	61087
29	28 52 9.7	5 37 54.2	7 45.8	2 13 49.0	39 18.4	9.512 5006	57068
30	34 34 17.0	5 46 15.6	5 34.4	1 33 24.4	41 27.0	9.507 0281	52213
July 1	40 24 29.4	5 54 2.6	- 3 6.1	-0 51 3.6	+43 9.8	9.502 0873	-46461
2	46 22 7.4	6 1 5.0	- 0 26.6	-0 7 15.4	+44 21.0	9.497 7641	-39866

FOR GREENWICH MEAN NOON.

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		° ' "	° ' "	' "	° ' "	' "		
July	1	40 24 29.4	5 54 2.6	- 3 6.1	-0 51 3.6	+43 9.8	9.502 0873	-46461
	2	46 22 7.4	6 1 5.0	- 0 26.6	-0 7 15.4	44 21.0	9.497 7641	39866
	3	52 26 21.1	6 7 12.2	+ 2 16.9	+0 37 26.0	44 55.4	9.494 1399	32496
	4	58 36 10.0	6 12 13.8	4 56.6	1 22 21.9	44 49.3	9.491 2872	24459
	5	64 50 23.7	6 16 0.4	7 24.0	2 6 50.1	43 59.8	9.489 2658	15894
	6	71 7 43.2	6 18 24.4	+ 9 31.3	+2 50 6.6	+42 26.0	9.488 1201	- 6979
	7	77 26 43.2	6 19 20.5	11 11.3	3 31 28.0	40 9.9	9.487 8751	+ 2089
	8	83 45 53.9	6 18 45.6	12 18.7	4 10 13.4	37 14.8	9.488 5365	11116
	9	90 3 44.3	6 16 40.2	12 50.1	4 45 46.3	33 46.0	9.490 0899	19892
	10	96 18 45.1	6 13 7.2	12 44.6	5 17 36.4	29 50.4	9.492 5004	28232
	11	102 29 31.4	6 8 12.4	+12 3.5	+5 45 20.6	+25 35.6	9.495 7165	+35978
	12	108 34 45.6	6 2 4.5	10 50.4	6 8 43.9	21 9.8	9.499 6719	43002
	13	114 33 19.3	5 54 53.3	9 10.3	6 27 39.2	16 40.8	9.504 2897	49216
	14	120 24 14.8	5 46 50.0	7 9.4	6 42 6.6	12 15.2	9.509 4861	54567
	15	126 6 45.7	5 38 6.2	4 54.3	6 52 12.6	7 58.8	9.515 1736	59037
	16	131 40 17.5	5 28 53.4	+ 2 31.6	+6 58 8.9	+ 3 56.4	9.521 2645	+62640
	17	137 4 26.4	5 19 22.2	+ 0 7.5	7 0 11.2	+ 0 11.3	9.527 6737	66409
	18	142 18 59.1	5 9 42.5	- 2 12.6	6 58 38.0	- 3 14.6	9.534 3203	67400
	19	147 23 51.4	5 0 2.6	4 24.3	6 53 48.9	6 20.2	9.541 1300	68680
	20	152 19 6.7	4 50 29.8	6 24.1	6 46 4.6	9 5.2	9.548 0348	69318
	21	157 4 55.2	4 41 9.8	- 8 9.4	+6 35 45.2	-11 30.2	9.554 9745	+69386
	22	161 41 32.0	4 32 7.0	9 38.6	6 23 10.4	13 36.3	9.561 8954	68956
	23	166 9 16.1	4 23 24.8	10 50.8	6 8 38.5	15 24.6	9.568 7515	68100
	24	170 28 29.4	4 15 5.8	11 45.8	5 52 26.6	16 56.6	9.575 5032	66878
	25	174 39 35.9	4 7 11.4	12 23.9	5 34 50.3	18 13.8	9.582 1167	65346
	26	178 43 0.8	3 59 42.6	-12 45.7	+5 16 3.5	-19 17.7	9.588 5641	+63562
	27	182 39 9.8	3 52 39.7	12 52.3	4 56 18.8	20 9.8	9.594 8221	61566
	28	186 28 28.8	3 46 2.6	12 44.8	4 35 47.3	20 51.6	9.600 8716	58397
	29	190 11 23.6	3 39 51.2	12 24.4	4 14 38.7	21 24.2	9.606 6970	57092
	30	193 48 19.4	3 34 4.4	11 52.5	3 53 1.5	21 49.0	9.612 2863	54678
	31	197 19 40.5	3 28 41.8	-11 10.4	+3 31 3.1	-22 6.8	9.617 6296	+52178
Aug.	1	200 45 50.9	3 23 42.6	10 19.6	3 8 50.0	22 18.6	9.622 7196	49618
	2	204 7 13.1	3 19 5.6	9 21.4	2 46 27.7	22 25.2	9.627 5506	47002
	3	207 24 9.2	3 14 50.0	8 16.8	2 24 1.0	22 27.4	9.632 1188	44358
	4	210 37 0.0	3 10 54.9	7 7.3	2 1 34.1	22 25.8	9.636 4213	41688
	5	213 46 5.5	3 7 19.4	- 5 53.9	+1 39 10.5	-22 21.0	9.640 4561	+39008
	6	216 51 44.9	3 4 2.4	4 37.5	1 16 53.2	22 13.1	9.644 2226	36322
	7	219 54 16.3	3 1 3.2	3 19.3	0 54 45.1	22 2.8	9.647 7203	33632
	8	222 53 57.1	2 58 21.2	2 0.1	0 32 48.3	21 50.4	9.650 9492	30948
	9	225 51 4.1	2 55 55.4	- 0 40.6	+0 11 4.8	21 36.2	9.653 9101	28270
	10	228 45 53.1	2 53 45.3	+ 0 38.1	-0 10 23.5	-21 20.2	9.656 6035	+25600
	11	231 38 39.7	2 51 50.2	1 55.7	0 31 35.2	21 2.8	9.659 0303	22937
	12	234 29 38.4	2 50 9.6	3 11.2	0 52 28.8	20 44.2	9.661 1913	20286
	13	237 19 3.5	2 48 43.0	4 24.1	1 13 3.1	20 24.2	9.663 0879	17646
	14	240 7 9.0	2 47 30.1	5 34.0	1 33 16.8	20 3.2	9.664 7209	15015
	15	242 54 8.1	2 46 30.3	+ 6 40.2	-1 53 9.0	-19 41.0	9.666 0912	+12392
	16	245 40 13.9	2 45 43.4	+ 7 42.2	-2 12 38.5	-19 17.9	9.667 1996	+ 9777

FOR GREENWICH MEAN NOON.

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		° ' "	° ' "	' "	° ' "	' "		
Aug.	16	245 40 13.9	2 45 43.4	+ 7 42.2	-2 12 38.5	-19 17.9	9.667 1996	+ 9777
	17	248 25 39.2	2 45 9.2	8 39.7	2 31 44.4	18 53.7	9.668 0468	7168
	18	251 10 36.6	2 44 47.6	9 32.2	2 50 25.5	18 28.4	9.668 6333	4564
	19	253 55 18.5	2 44 38.2	10 19.3	3 8 40.8	18 2.0	9.668 9596	+ 1962
	20	256 39 57.2	2 44 41.1	11 0.6	3 26 29.2	17 34.6	9.669 0258	- 638
	21	259 24 44.8	2 44 56.2	+11 36.0	-3 43 49.6	-17 5.9	9.668 8321	- 3237
	22	262 9 53.6	2 45 23.4	12 4.9	4 0 40.6	16 35.9	9.668 3783	5839
	23	264 55 35.8	2 46 3.0	12 27.2	4 17 1.0	16 4.6	9.667 6641	8446
	24	267 42 3.8	2 46 55.0	12 42.6	4 32 49.3	15 31.8	9.666 6889	11069
	25	270 29 30.0	2 47 59.4	12 50.9	4 48 3.9	14 57.2	9.665 4521	13677
	26	273 18 7.0	2 49 16.7	+12 51.8	-5 2 43.1	-14 20.8	9.663 9532	-16304
	27	276 8 7.8	2 50 47.1	12 45.2	5 16 44.9	13 42.4	9.662 1911	18940
	28	278 59 45.6	2 52 30.7	12 31.0	5 30 7.2	13 1.8	9.660 1649	21536
	29	281 53 13.8	2 54 28.1	12 9.1	5 42 47.7	12 18.8	9.657 8735	24242
	30	284 48 46.5	2 56 39.6	11 39.3	5 54 43.8	11 33.0	9.655 3161	26908
	31	287 46 37.9	2 59 5.7	+11 1.8	-6 5 52.6	-10 44.2	9.652 4915	-29583
Sept.	1	290 47 2.9	3 1 46.9	10 16.6	6 16 11.1	9 52.2	9.649 3993	32264
	2	293 50 16.9	3 4 43.8	9 23.7	6 25 35.7	8 56.4	9.646 0385	34950
	3	296 56 35.8	3 7 56.8	8 23.4	6 34 2.7	7 56.8	9.642 4091	37640
	4	300 6 16.2	3 11 26.8	7 16.1	6 41 27.9	6 52.8	9.638 5107	40325
	5	303 19 35.4	3 15 14.5	+ 6 2.0	-6 47 46.7	- 5 44.0	9.634 3444	-43001
	6	306 36 51.3	3 19 20.4	4 41.8	6 52 54.1	4 29.9	9.629 9111	45660
	7	309 58 22.6	3 23 45.3	3 16.1	6 56 44.6	3 10.1	9.625 2134	48290
	8	313 24 28.5	3 28 29.8	1 45.7	6 59 12.3	1 44.2	9.620 2545	50880
	9	316 55 29.1	3 33 34.8	+ 0 11.6	7 0 10.8	- 0 11.7	9.615 0393	53415
	10	320 31 45.1	3 39 0.8	- 1 25.1	-6 59 33.3	+ 1 28.0	9.609 5740	-55876
	11	324 13 38.0	3 44 48.6	3 2.8	6 57 12.2	3 15.4	9.603 8674	58240
	12	328 1 29.5	3 50 53.2	4 40.1	6 52 59.9	5 10.6	9.597 9300	60484
	13	331 55 42.0	3 57 30.5	6 14.9	6 46 48.1	7 14.4	9.591 7759	62572
	14	335 56 38.0	4 4 26.3	7 45.3	6 38 28.4	9 26.6	9.585 4220	64471
	15	340 4 40.0	4 11 42.4	- 9 8.9	-6 27 52.1	+11 47.5	9.578 8895	-66138
	16	344 20 10.2	4 19 21.5	10 23.1	6 14 50.6	14 17.0	9.572 2039	67520
	17	348 43 30.0	4 27 21.6	11 25.4	5 59 15.4	16 54.6	9.565 3964	68573
	18	353 14 59.7	4 35 41.0	12 12.8	5 40 58.9	19 39.6	9.558 5025	69231
	19	357 54 57.7	4 44 17.8	12 42.6	5 19 54.2	22 30.8	9.551 5657	69423
	20	2 43 39.9	4 53 8.8	-12 52.3	-4 55 55.9	+25 26.4	9.544 6356	-69064
	21	7 41 18.8	5 2 10.4	12 39.5	4 29 0.9	28 23.8	9.537 7689	68142
	22	12 48 2.8	5 11 18.0	12 2.5	3 59 8.5	31 20.5	9.531 0297	66522
	23	18 3 54.7	5 20 25.3	11 0.4	3 26 21.5	34 12.4	9.524 4894	64155
	24	23 28 51.0	5 29 25.4	9 33.1	2 50 47.0	36 54.8	9.518 2256	60982
	25	29 2 40.5	5 38 10.3	- 7 42.1	-2 12 36.8	+39 22.8	9.512 3214	-56958
	26	34 45 3.5	5 46 30.8	5 30.1	1 32 8.2	41 30.6	9.506 8634	52056
	27	40 35 30.6	5 54 16.8	3 1.3	0 49 44.2	43 12.4	9.501 9395	46276
	28	46 33 22.1	6 1 17.8	- 0 21.6	-0 5 53.8	44 22.6	9.497 6363	39654
	29	52 37 47.6	6 7 23.1	+ 2 21.9	+0 38 48.8	44 56.0	9.494 0344	32262
	30	58 47 46.3	6 12 22.5	+ 5 1.3	+1 23 44.5	+44 48.4	9.491 2061	-24205
Oct.	1	65 2 7.5	6 16 6.6	+ 7 28.3	+2 8 11.2	+43 57.6	9.489 2108	-15628

FOR GREENWICH MEAN NOON.

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		° ' "	° ' "	' "	° ' "	' "		
Oct.	1	65 2 7.5	6 16 6.6	+ 7 28.3	+2 8 11.2	+43 57.6	9.489 2108	-15628
	2	71 19 32.0	6 18 28.1	9 34.8	2 51 24.9	43 22.6	9.488 0920	- 6706
	3	77 38 34.3	6 19 21.4	11 13.9	3 32 42.2	40 5.1	9.487 8748	+ 2370
	4	83 57 44.5	6 18 43.8	12 20.2	4 11 22.2	37 8.8	9.488 5641	11390
	5	90 15 31.7	6 16 35.6	12 50.4	4 46 48.7	33 39.2	9.490 1443	20156
	6	96 30 26.5	6 13 0.0	+12 43.8	+5 18 31.6	+29 42.8	9.492 5805	+28482
	7	102 41 4.4	6 8 2.9	12 1.7	5 46 8.0	25 27.6	9.495 8206	36308
	8	108 46 7.9	6 1 52.8	10 47.7	6 9 23.1	21 1.6	9.499 7978	43209
	9	114 44 28.9	5 54 39.6	9 6.8	6 28 10.1	16 32.4	9.504 4352	49398
	10	120 35 10.0	5 46 34.9	7 5.4	6 42 29.2	12 7.0	9.509 6484	54722
	11	126 17 25.3	5 37 50.0	+ 4 50.0	+6 52 27.3	+ 7 51.1	9.515 3501	+59165
	12	131 50 40.4	5 28 36.3	2 27.1	6 58 16.1	3 49.2	9.521 4524	62740
	13	137 14 32.0	5 19 4.8	+ 0 3.1	7 0 11.5	+ 0 4.6	9.527 8706	65486
	14	142 28 47.2	5 9 24.8	- 2 16.9	6 58 31.8	- 3 20.6	9.534 5238	67454
	15	147 33 21.8	4 59 45.1	4 28.2	6 53 37.0	6 26.6	9.541 3379	68714
	16	152 28 19.8	4 50 12.6	- 6 27.6	+6 45 47.5	- 9 10.0	9.548 2453	+69332
	17	157 13 51.2	4 40 52.9	8 12.4	6 35 23.6	11 34.5	9.555 1855	69884
	18	161 50 11.4	4 31 50.6	9 41.1	6 22 44.8	13 40.0	9.562 1055	69940
	19	166 17 39.4	4 23 9.1	10 52.8	6 8 9.6	15 27.7	9.568 9593	69071
	20	170 36 37.4	4 14 50.9	11 47.2	5 51 54.8	16 59.2	9.575 7076	66840
	21	174 47 29.4	4 6 57.2	-12 24.8	+5 34 16.1	-18 16.0	9.582 3169	+65300
	22	178 50 40.4	3 59 29.2	12 46.2	5 15 27.3	19 19.5	9.588 7591	63506
	23	182 46 36.4	3 53 27.0	12 52.3	4 55 41.0	20 11.4	9.595 0112	61504
	24	186 35 43.1	3 45 50.8	12 44.3	4 35 8.1	20 52.8	9.601 0541	59330
	25	190 18 26.4	3 39 40.0	12 23.5	4 13 58.5	21 25.1	9.606 8727	57022
	26	193 55 11.4	3 33 54.1	-11 51.3	+3 52 20.5	-21 49.6	9.612 4548	+54604
	27	197 26 22.6	3 28 32.2	11 9.0	3 30 21.6	22 7.2	9.617 7906	52102
	28	200 52 23.6	3 23 33.6	10 17.9	3 8 8.1	22 18.8	9.622 8729	49535
	29	204 13 37.3	3 18 57.4	9 19.4	2 45 45.6	22 25.4	9.627 6960	46922
	30	207 30 25.4	3 14 42.4	8 14.7	2 23 18.8	22 27.5	9.632 2561	44276
Nov.	31	210 43 8.9	3 10 47.9	- 7 5.1	+2 0 51.9	-22 25.7	9.636 5504	+41608
	1	213 52 7.7	3 7 12.9	5 51.5	1 38 28.5	22 20.6	9.640 5772	38926
	2	216 57 40.9	3 3 56.4	4 35.1	1 16 11.5	22 12.8	9.644 3354	36239
	3	220 0 6.6	3 0 57.9	3 16.8	0 54 3.6	22 2.5	9.647 8250	33551
	4	222 59 42.4	2 58 16.4	1 57.6	0 32 7.2	21 50.0	9.651 0457	30864
	5	225 56 44.8	2 55 51.1	- 0 38.2	+0 10 24.2	-21 35.6	9.653 9982	+28188
	6	228 51 29.8	2 53 41.4	+ 0 40.6	-0 11 3.6	21 19.7	9.656 6835	25518
	7	231 44 12.6	2 51 46.8	1 58.1	0 32 14.7	21 2.2	9.659 1020	22855
	8	234 35 8.2	2 50 6.7	3 13.5	0 53 7.7	20 43.6	9.661 2549	20206
	9	237 24 30.6	2 48 40.4	4 26.4	1 13 41.4	20 23.6	9.663 1435	17566
	10	240 12 33.7	2 47 28.0	+ 5 36.1	-1 33 54.5	-20 2.4	9.664 7683	+14932
	11	242 59 30.9	2 46 28.6	6 42.2	1 53 45.9	19 40.2	9.666 1304	12312
	12	245 45 35.2	2 45 42.2	7 44.1	2 13 14.7	19 17.2	9.667 2308	9696
	13	248 30 59.5	2 45 8.4	8 41.4	2 32 19.8	18 52.9	9.668 0698	7067
	14	251 15 56.2	2 44 47.0	9 33.7	2 51 0.1	18 27.6	9.668 6484	4483
	15	254 0 37.7	2 44 38.0	+10 20.7	-3 9 14.6	-18 1.2	9.668 9665	+ 1882
	16	256 45 16.4	2 44 41.4	+11 1.8	-3 27 2.2	-17 33.7	9.669 0249	- 717

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Nov.	16	256 45 16.4	2 44 41.4	+11 1.8	-3 27 2.2	-17 33.7	9.669 0249	- 717
	17	259 30 4.5	2 44 56.8	11 37.0	3 44 21.6	17 5.0	9.668 8231	3318
	18	262 15 14.1	2 45 24.4	12 5.7	4 1 11.7	16 35.0	9.668 3613	5921
	19	265 0 57.5	2 46 4.4	12 27.8	4 17 31.2	16 3.6	9.667 6388	8528
	20	267 47 27.0	2 46 56.8	12 43.0	4 33 18.4	15 30.6	9.666 6556	11140
	21	270 34 55.2	2 48 1.6	+12 51.0	-4 48 31.9	-14 56.1	9.665 4107	-13759
	22	273 23 34.5	2 49 19.2	12 51.7	5 3 10.0	14 19.7	9.663 9036	16386
	23	276 13 38.1	2 50 50.0	12 44.9	5 17 10.6	13 41.2	9.662 1333	19022
	24	279 5 19.0	2 52 34.1	12 30.4	5 30 31.6	13 0.5	9.660 0988	21668
	25	281 58 50.9	2 54 31.9	12 8.2	5 43 10.8	12 17.4	9.657 7993	24324
	26	284 54 27.5	2 56 43.8	+11 38.3	-5 55 5.4	-11 31.4	9.655 2337	-26991
	27	287 52 23.4	2 59 10.4	11 0.5	6 6 12.7	10 42.6	9.652 4008	29666
	28	290 52 53.4	3 1 52.1	10 15.0	6 16 29.6	9 50.5	9.649 3003	32348
	29	293 56 12.8	3 4 49.4	9 21.9	6 25 52.5	8 54.6	9.645 9311	35036
	30	297 2 37.6	3 8 3.0	8 21.4	6 34 17.6	7 54.9	9.642 2932	37724
Dec.	1	300 12 24.5	3 11 33.7	+ 7 13.9	-6 41 40.8	- 6 50.7	9.638 3864	-40410
	2	303 25 50.8	3 15 21.8	5 59.6	6 47 57.4	5 41.7	9.634 2117	43084
	3	306 43 14.3	3 19 28.3	4 39.2	6 53 2.5	4 27.5	9.629 7702	45742
	4	310 4 53.7	3 23 53.7	3 13.4	6 56 50.5	3 7.6	9.625 0643	48371
	5	313 31 8.3	3 28 39.0	1 42.8	6 59 15.6	1 41.4	9.620 0974	50960
	6	317 2 18.4	3 33 44.6	+ 0 8.6	-7 0 11.2	- 0 8.6	9.614 8742	-53494
	7	320 38 44.5	3 39 11.2	- 1 28.1	6 59 30.5	+ 1 31.3	9.609 4012	56952
	8	324 20 48.1	3 44 59.6	3 5.9	6 57 6.1	3 18.8	9.603 6871	58312
	9	328 8 51.1	3 51 10.0	4 43.0	6 52 50.2	5 14.4	9.597 7428	60551
	10	332 3 15.7	3 57 43.0	6 17.8	6 46 34.6	7 18.2	9.591 5821	62634
	11	336 4 24.6	4 4 38.5	- 7 48.0	-6 38 10.8	+ 9 30.8	9.585 2223	-64527
	12	340 12 40.1	4 11 56.3	9 11.4	6 27 30.1	11 52.0	9.578 6845	66186
	13	344 28 24.5	4 19 36.1	10 25.3	6 14 23.9	14 21.8	9.571 9945	67562
	14	348 51 59.2	4 27 36.8	11 27.1	5 58 43.8	16 59.6	9.565 1834	68900
	15	353 23 44.4	4 35 56.7	12 14.0	5 40 22.2	19 44.8	9.558 2876	69244
	16	358 3 58.4	4 44 34.0	-12 43.2	-5 19 12.1	+23 36.2	9.551 3500	-69422
	17	2 52 57.1	4 53 25.5	12 52.2	4 55 8.4	25 31.8	9.544 4209	69066
	18	7 50 52.9	5 2 27.4	12 38.7	4 28 7.9	28 29.4	9.537 5570	68106
	19	12 57 53.9	5 11 35.0	12 1.0	3 58 9.9	31 26.0	9.530 8225	66464
	20	18 14 2.8	5 20 42.2	10 58.0	3 25 17.6	34 17.4	9.524 2893	64072
	21	23 39 15.9	5 29 42.0	- 9 30.0	-2 49 38.1	+36 59.6	9.518 0350	-60875
	22	29 13 21.8	5 38 26.4	7 38.3	2 11 23.3	39 27.1	9.512 1429	56821
	23	34 56 0.5	5 46 46.0	5 25.7	1 30 50.7	41 34.2	9.506 7001	51890
	24	40 46 42.2	5 54 30.8	2 56.5	0 48 23.6	43 15.2	9.501 7941	46084
	25	46 44 46.9	6 1 30.2	- 0 16.6	-0 4 31.0	44 24.2	9.497 5113	39438
	26	52 49 23.9	6 7 33.6	+ 2 27.0	+0 40 12.6	+44 56.4	9.493 9323	-32022
	27	58 59 32.0	6 12 30.8	5 6.1	1 25 8.2	44 47.6	9.491 1289	23947
	28	65 14 0.4	6 16 12.6	7 32.6	2 9 33.3	43 55.2	9.489 1601	15357
	29	71 31 29.5	6 18 31.4	9 38.4	2 52 44.0	42 19.0	9.488 0689	- 6426
	30	77 50 33.7	6 19 22.0	11 16.5	3 33 57.0	40 0.3	9.487 8798	+ 2650
	31	84 9 43.0	6 18 41.4	+12 21.7	+4 12 31.6	+37 2.8	9.488 5971	+11668
	32	90 27 26.4	...	+12 50.8	+4 47 51.6	...	9.490 2046	...

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Jan.	1	16 45	20.74	+13.167	-21	9	39.0	-29.55	0.154 0588	+610.2	5.99	6.17	22 4.3
	2	16 50	37.21	13.205	21	21	10.1	28.03	0.155 5154	603.7	5.98	6.15	22 5.7
	3	16 55	54.57	13.241	21	32	4.4	26.49	0.156 9568	597.4	5.96	6.13	22 7.0
	4	17 1	12.77	13.275	21	42	21.3	24.92	0.158 3831	591.2	5.94	6.11	22 8.4
	5	17 6	31.78	13.308	21	52	0.5	23.34	0.159 7944	585.0	5.92	6.09	22 9.8
	6	17 11	51.56	+13.340	-22	1	1.4	-21.73	0.161 1909	+578.8	5.90	6.07	22 11.2
	7	17 17	12.07	13.369	22	9	23.6	20.11	0.162 5726	572.7	5.88	6.05	22 12.6
	8	17 22	33.27	13.397	22	17	6.6	18.47	0.163 9398	566.6	5.86	6.03	22 14.0
	9	17 27	55.10	13.422	22	24	10.0	16.81	0.165 2925	560.6	5.84	6.01	22 15.5
	10	17 33	17.53	13.446	22	30	33.5	15.14	0.166 6308	554.6	5.82	5.99	22 16.9
	11	17 38	40.49	+13.467	-22	36	16.7	-13.46	0.167 9548	+548.7	5.81	5.98	22 18.3
	12	17 44	3.94	13.487	22	41	19.4	11.76	0.169 2645	542.7	5.79	5.96	22 19.8
	13	17 49	27.83	13.504	22	45	41.1	10.05	0.170 5600	536.8	5.77	5.94	22 21.3
	14	17 54	52.10	13.518	22	49	21.8	8.34	0.171 8413	530.9	5.75	5.92	22 22.7
	15	18 0	16.69	13.531	22	52	21.1	6.61	0.173 1085	525.0	5.74	5.91	22 24.2
	16	18 5	41.55	+13.541	-22	54	38.8	-4.87	0.174 3615	+519.1	5.73	5.89	22 25.7
	17	18 11	6.62	13.548	22	56	14.7	3.13	0.175 6004	513.3	5.71	5.87	22 27.2
	18	18 16	31.84	13.553	22	57	8.8	-1.38	0.176 8253	507.4	5.70	5.86	22 28.6
	19	18 21	57.14	13.555	22	57	21.0	+0.37	0.178 0361	501.6	5.68	5.84	22 30.1
	20	18 27	22.47	13.555	22	56	51.1	2.12	0.179 2330	495.8	5.66	5.82	22 31.6
	21	18 32	47.77	+13.553	-22	55	39.3	+3.87	0.180 4160	+490.0	5.65	5.81	22 33.1
	22	18 38	12.97	13.547	22	53	45.5	5.62	0.181 5851	484.3	5.63	5.79	22 34.5
	23	18 43	38.01	13.539	22	51	9.7	7.36	0.182 7406	478.6	5.62	5.78	22 36.0
	24	18 49	2.82	13.528	22	47	52.1	9.10	0.183 8824	472.9	5.60	5.76	22 37.5
	25	18 54	27.35	13.515	22	43	52.7	10.84	0.185 0108	467.4	5.59	5.75	22 39.0
	26	18 59	51.54	+13.500	-22	39	11.7	+12.57	0.186 1259	+461.9	5.57	5.73	22 40.4
	27	19 5	15.34	13.482	22	33	49.3	14.30	0.187 2279	456.4	5.56	5.72	22 41.9
	28	19 10	38.68	13.462	22	27	45.7	16.01	0.188 3169	451.1	5.54	5.70	22 43.3
	29	19 16	1.51	13.440	22	21	1.1	17.71	0.189 3932	445.8	5.53	5.69	22 44.7
	30	19 21	23.78	13.416	22	13	35.8	19.40	0.190 4569	440.6	5.52	5.68	22 46.1
Feb.	31	19 26	45.44	+13.389	-22	5	30.1	+21.07	0.191 5081	+435.4	5.50	5.66	22 47.6
	1	19 32	6.45	13.361	21	56	44.3	22.74	0.192 5470	430.3	5.49	5.65	22 49.0
	2	19 37	26.76	13.331	21	47	18.7	24.39	0.193 5737	425.2	5.47	5.63	22 50.4
	3	19 42	46.33	13.299	21	37	13.7	26.02	0.194 5882	420.2	5.46	5.62	22 51.7
	4	19 48	5.11	13.266	21	26	29.8	27.64	0.195 5907	415.2	5.45	5.61	22 53.1
	5	19 53	23.08	+13.231	-21	15	7.2	+29.24	0.196 5813	+410.2	5.44	5.60	22 54.4
	6	19 58	40.19	13.195	21	3	6.4	30.82	0.197 5599	405.3	5.42	5.58	22 55.8
	7	20 3	56.41	13.157	20	50	28.0	32.38	0.198 5267	400.4	5.41	5.57	22 57.1
	8	20 9	11.70	13.117	20	37	12.3	33.92	0.199 4818	395.5	5.40	5.56	22 58.4
	9	20 14	26.03	13.077	20	23	20.0	35.44	0.200 4250	390.6	5.39	5.55	22 59.6
	10	20 19	39.38	+13.035	-20	8	51.5	+36.93	0.201 3565	+385.7	5.38	5.53	23 0.9
	11	20 24	51.72	12.993	19	53	47.4	38.41	0.202 2762	380.8	5.37	5.52	23 2.2
	12	20 30	3.03	12.949	19	38	8.2	39.86	0.203 1842	375.9	5.36	5.51	23 3.4
	13	20 35	13.28	12.905	19	21	54.5	41.28	0.204 0804	371.0	5.35	5.50	23 4.6
	14	20 40	22.46	12.860	19	5	7.0	42.68	0.204 9648	366.1	5.34	5.49	23 5.8
	15	20 45	30.55	+12.814	-18	47	46.2	+44.05	0.205 8375	+361.2	5.33	5.48	23 7.0
	16	20 50	37.53	+12.768	-18	29	52.7	+45.40	0.206 6983	+356.2	5.32	5.47	23 8.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Feb. 16	20	50	37.53	+12.768	-18	29	52.7	+45.40	0.206 6983	+356.2	5.32	5.47	23 8.1
17	20	55	43.40	12.721	18	11	27.2	46.72	0.207 5472	351.2	5.31	5.46	23 9.3
18	21	0	48.13	12.674	17	52	30.4	48.01	0.208 3841	346.2	5.30	5.45	23 10.4
19	21	5	51.73	12.626	17	33	3.0	49.27	0.209 2091	341.3	5.28	5.43	23 11.5
20	21	10	54.18	12.578	17	13	5.7	50.50	0.210 0222	336.3	5.27	5.42	23 12.6
21	21	15	55.48	+12.530	-16	52	39.1	+51.71	0.210 8233	+331.3	5.26	5.41	23 13.6
22	21	20	55.62	12.482	16	31	44.0	52.88	0.211 6126	326.4	5.25	5.40	23 14.7
23	21	25	54.60	12.434	16	10	21.1	54.02	0.212 3900	321.5	5.25	5.40	23 15.7
24	21	30	52.44	12.386	15	48	31.1	55.14	0.213 1558	316.6	5.24	5.39	23 16.7
25	21	35	49.12	12.338	15	26	14.8	56.22	0.213 9099	311.8	5.23	5.38	23 17.7
26	21	40	44.66	+12.291	-15	3	32.9	+57.27	0.214 6524	+307.0	5.22	5.37	23 18.6
27	21	45	39.07	12.244	14	40	26.1	58.29	0.215 3835	302.3	5.21	5.36	23 19.6
28	21	50	32.36	12.197	14	16	55.1	59.28	0.216 1033	297.6	5.20	5.35	23 20.5
Mar. 1	21	55	24.54	12.152	13	53	0.7	60.24	0.216 8118	292.9	5.19	5.34	23 21.4
2	22	0	15.64	12.107	13	28	43.7	61.17	0.217 5091	288.2	5.18	5.33	23 22.3
3	22	5	5.67	+12.063	-13	4	4.6	+62.08	0.218 1953	+283.6	5.17	5.32	23 23.2
4	22	9	54.65	12.019	12	39	4.3	62.94	0.218 8704	279.0	5.17	5.32	23 24.0
5	22	14	42.60	11.977	12	13	43.5	63.78	0.219 5344	274.4	5.16	5.31	23 24.9
6	22	19	29.56	11.936	11	48	2.9	64.59	0.220 1874	269.8	5.15	5.30	23 25.7
7	22	24	15.54	11.896	11	22	3.2	65.37	0.220 8294	265.2	5.14	5.29	23 26.5
8	22	29	0.57	+11.857	-10	55	45.3	+66.12	0.221 4604	+260.6	5.13	5.28	23 27.3
9	22	33	44.68	11.819	10	29	9.7	66.84	0.222 0804	256.0	5.13	5.28	23 28.1
10	22	38	27.90	11.783	10	2	17.3	67.53	0.222 6894	251.5	5.12	5.27	23 28.8
11	22	43	10.26	11.748	9	35	8.7	68.18	0.223 2874	246.9	5.11	5.26	23 29.6
12	22	47	51.80	11.714	9	7	44.8	68.81	0.223 8744	242.2	5.11	5.26	23 30.3
13	22	52	32.53	+11.681	-8	40	6.2	+69.41	0.224 4501	+237.6	5.10	5.25	23 31.1
14	22	57	12.51	11.650	8	12	13.6	69.97	0.225 0147	232.9	5.09	5.24	23 31.8
15	23	1	51.76	11.621	7	44	7.8	70.50	0.225 5680	228.2	5.08	5.23	23 32.5
16	23	6	30.32	11.593	7	15	49.6	71.01	0.226 1099	223.4	5.08	5.23	23 33.2
17	23	11	8.23	11.566	6	47	19.6	71.48	0.226 6403	218.6	5.07	5.22	23 33.9
18	23	15	45.51	+11.541	-6	18	38.6	+71.93	0.227 1592	+213.8	5.07	5.22	23 34.5
19	23	20	22.21	11.517	5	49	47.3	72.34	0.227 6665	208.9	5.06	5.21	23 35.2
20	23	24	58.36	11.495	5	20	46.5	72.72	0.228 1621	204.0	5.05	5.20	23 35.8
21	23	29	33.99	11.475	4	51	37.0	73.07	0.228 6458	199.1	5.05	5.20	23 36.5
22	23	34	9.15	11.456	4	22	19.4	73.39	0.229 1176	194.1	5.04	5.19	23 37.1
23	23	38	43.87	+11.438	-3	52	54.5	+73.68	0.229 5774	+189.1	5.04	5.19	23 37.7
24	23	43	18.18	11.421	3	23	23.1	73.93	0.230 0253	184.1	5.03	5.18	23 38.4
25	23	47	52.12	11.407	2	53	45.9	74.16	0.230 4613	179.2	5.03	5.18	23 39.0
26	23	52	25.74	11.395	2	24	8.6	74.36	0.230 8854	174.2	5.03	5.17	23 39.6
27	23	56	59.07	11.383	1	54	17.0	74.52	0.231 2977	169.3	5.02	5.17	23 40.2
28	0	1	32.14	+11.373	-1	24	26.7	+74.66	0.231 6981	+164.4	5.02	5.16	23 40.8
29	0	6	5.01	11.366	0	54	33.6	74.76	0.232 0867	159.5	5.02	5.16	23 41.4
30	0	10	37.71	11.360	-0	24	38.3	74.84	0.232 4635	154.6	5.01	5.15	23 42.0
31	0	15	10.28	11.355	+0	5	18.5	74.89	0.232 8286	149.7	5.01	5.15	23 42.6
Apr. 1	0	19	42.77	11.353	0	35	16.1	74.91	0.233 1819	144.7	5.00	5.14	23 43.2
2	0	24	15.22	+11.352	+1	5	13.8	+74.89	0.233 5234	+139.9	5.00	5.14	23 43.8
3	0	28	47.66	+11.352	+1	35	10.8	+74.85	0.233 8532	+135.0	5.00	5.14	23 44.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
	h	m	s	s	°	'	"	"			"	"	h m
Apr.	1	0	19 42.77	+11.353	+	0	35 16.1	+74.91	0.233 1819	+144.7	5.00	5.14	23 43.2
	2	0	24 15.22	11.352		1	5 13.8	74.89	0.233 5234	139.9	5.00	5.14	23 43.8
	3	0	28 47.66	11.352		1	35 10.8	74.85	0.233 8532	136.0	5.00	5.14	23 44.4
	4	0	33 20.15	11.355		2	5 6.5	74.78	0.234 1712	130.1	4.99	5.13	23 45.0
	5	0	37 52.73	11.360		2	35 0.2	74.68	0.234 4775	126.1	4.99	5.13	23 45.6
	6	0	42 25.44	+11.366	+	3	4 51.1	+74.55	0.234 7719	+120.2	4.98	5.12	23 46.2
	7	0	46 58.31	11.374		3	34 38.5	74.39	0.235 0545	115.3	4.98	5.12	23 46.8
	8	0	51 31.40	11.384		4	4 21.8	74.21	0.235 3253	110.4	4.98	5.12	23 47.5
	9	0	56 4.75	11.395		4	34 0.3	73.99	0.235 5842	105.4	4.98	5.12	23 48.1
	10	1	0 38.39	11.409		5	3 33.2	73.74	0.235 8311	100.4	4.97	5.11	23 48.7
	11	1	5 12.38	+11.424	+	5	32 59.7	+73.46	0.236 0659	+ 95.3	4.97	5.11	23 49.3
	12	1	9 46.76	11.441		6	2 19.3	73.16	0.236 2885	90.2	4.97	5.11	23 50.0
	13	1	14 21.56	11.459		6	31 31.2	72.82	0.236 4989	85.1	4.96	5.10	23 50.6
	14	1	18 56.82	11.479		7	0 34.6	72.45	0.236 6968	79.8	4.96	5.10	23 51.3
	15	1	23 32.59	11.501		7	29 28.8	72.06	0.236 8821	74.6	4.96	5.10	23 51.9
	16	1	28 8.90	+11.525	+	7	58 13.1	+71.63	0.237 0547	+ 60.2	4.96	5.10	23 52.6
	17	1	32 45.79	11.550		8	26 46.8	71.17	0.237 2144	63.9	4.96	5.10	23 53.3
	18	1	37 23.30	11.576		8	55 9.1	70.68	0.237 3612	58.5	4.95	5.09	23 54.0
	19	1	42 1.45	11.604		9	23 19.3	70.16	0.237 4950	53.0	4.95	5.09	23 54.7
	20	1	46 40.29	11.633		9	51 16.6	69.61	0.237 6156	47.5	4.95	5.09	23 55.4
	21	1	51 19.84	+11.663	+10	19 0.3	+69.03	0.237 7229	+ 41.9	4.95	5.09	23 56.1	
	22	1	56 0.14	11.695		10	46 29.6	68.41	0.237 8169	36.4	4.95	5.09	23 56.9
	23	2	0 41.22	11.728		11	13 43.8	67.77	0.237 8975	30.8	4.95	5.09	23 57.6
	24	2	5 23.10	11.762		11	40 42.1	67.09	0.237 9647	25.2	4.95	5.09	23 58.4
	25	2	10 5.82	11.797		12	7 23.8	66.38	0.238 0184	19.6	4.95	5.09	23 59.2
	26	2	14 49.39	+11.834	+12	33 48.1	+65.64	0.238 0586	+ 14.0	4.95	5.09	...	...
	27	2	19 33.86	11.872		12	59 54.3	64.87	0.238 0854	8.4	4.95	5.09	0 0.0
	28	2	24 19.24	11.910		13	25 41.7	64.07	0.238 0988	+ 2.8	4.95	5.09	0 0.8
	29	2	29 5.56	11.950		13	51 9.5	63.24	0.238 0987	- 2.9	4.95	5.09	0 1.6
	30	2	33 52.85	11.991		14	16 17.0	62.38	0.238 0851	8.5	4.95	5.09	0 2.5
May	1	2 38 41.12	+12.032	+14	41 3.4	+61.48	0.238 0580	- 14.1	4.95	5.09	0 3.3		
	2	2 43 30.40	12.075		15 5 28.0	60.56	0.238 0175	19.7	4.95	5.09	0 4.2		
	3	2 48 20.72	12.118		15 29 30.1	59.61	0.237 9634	25.4	4.95	5.09	0 5.1		
	4	2 53 12.08	12.162		15 53 8.9	58.62	0.237 8958	31.0	4.95	5.09	0 6.0		
	5	2 58 4.50	12.207		16 16 23.7	57.61	0.237 8146	36.6	4.95	5.09	0 6.9		
	6	3 2 58.01	+12.252	+16	39 13.8	+56.56	0.237 7199	- 42.3	4.95	5.09	0 7.9		
	7	3 7 52.60	12.298		17 1 38.5	55.49	0.237 6115	48.0	4.95	5.09	0 8.9		
	8	3 12 48.31	12.344		17 23 37.0	54.38	0.237 4894	53.7	4.95	5.09	0 9.9		
	9	3 17 45.13	12.391		17 45 8.6	53.25	0.237 3536	59.4	4.95	5.09	0 10.9		
	10	3 22 43.08	12.438		18 6 12.6	52.08	0.237 2040	65.2	4.96	5.10	0 11.9		
	11	3 27 42.17	+12.486	+18	26 48.3	+50.89	0.237 0404	- 71.1	4.96	5.10	0 12.9		
	12	3 32 42.39	12.533		18 46 54.9	49.66	0.236 8628	76.9	4.96	5.10	0 14.0		
	13	3 37 43.74	12.580		19 6 31.8	48.41	0.236 6710	82.9	4.96	5.10	0 15.1		
	14	3 42 46.23	12.627		19 25 38.2	47.12	0.236 4649	88.9	4.96	5.10	0 16.2		
	15	3 47 49.85	12.674		19 44 13.5	45.81	0.236 2444	94.9	4.97	5.11	0 17.3		
	16	3 52 54.59	+12.721	+20	2 17.0	+44.47	0.236 0092	-101.1	4.97	5.11	0 18.4		
	17	3 58 0.44	+12.767	+20	19 48.0	+43.10	0.235 7593	-107.2	4.97	5.11	0 19.6		

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"					h	m
May	17	3	58	0.44	+12.767	+20	19	48.0	+43.10	0.235 7593	-107.2	4.97	5.11	0 19.6
	18	4	3	7.39	12.812	20	36	45.8	41.71	0.235 4945	113.4	4.98	5.12	0 20.8
	19	4	8	15.42	12.857	20	53	9.9	40.29	0.235 2148	119.7	4.98	5.12	0 22.0
	20	4	18	24.50	12.900	21	8	59.5	38.84	0.234 9200	126.0	4.98	5.12	0 23.2
	21	4	18	34.62	12.943	21	24	14.0	37.37	0.234 6100	132.3	4.99	5.13	0 24.4
	22	4	23	45.75	+12.984	+21	38	52.9	+35.87	0.234 2848	-138.7	4.99	5.13	0 25.6
	23	4	28	57.86	13.024	21	52	55.5	34.34	0.233 9443	145.1	4.99	5.13	0 26.9
	24	4	34	10.91	13.063	22	6	21.2	32.80	0.233 5885	151.4	5.00	5.14	0 28.1
	25	4	39	24.89	13.101	22	19	9.6	31.23	0.233 2174	157.8	5.00	5.14	0 29.4
	26	4	44	39.75	13.137	22	31	20.1	29.64	0.232 8310	164.2	5.01	5.15	0 30.7
	27	4	49	55.46	+13.171	+22	42	52.1	+28.03	0.232 4292	-170.6	5.01	5.15	0 32.1
June	28	4	55	11.96	13.204	22	53	45.3	26.40	0.232 0120	177.0	5.02	5.16	0 33.4
	29	5	0	29.23	13.235	23	3	59.1	24.75	0.231 5794	183.5	5.02	5.16	0 34.8
	30	5	5	47.23	13.264	23	13	33.1	23.08	0.231 1314	189.9	5.03	5.17	0 36.1
	31	5	11	5.90	13.291	23	22	27.0	21.40	0.230 6681	196.2	5.03	5.17	0 37.5
	1	5	16	25.20	+13.317	+23	30	40.2	+19.70	0.230 1894	-202.6	5.03	5.18	0 38.9
	2	5	21	45.08	13.340	23	38	12.4	17.99	0.229 6954	209.0	5.04	5.19	0 40.3
	3	5	27	5.49	13.361	23	45	3.4	16.26	0.229 1861	215.4	5.04	5.19	0 41.7
	4	5	32	26.37	13.380	23	51	12.7	14.52	0.228 6614	221.8	5.05	5.20	0 43.1
	5	5	37	47.69	13.396	23	56	40.2	12.77	0.228 1215	228.2	5.05	5.20	0 44.5
	6	5	43	9.38	+13.411	+24	1	25.5	+11.01	0.227 5662	-234.6	5.06	5.21	0 45.9
	7	5	48	31.39	13.423	24	5	28.5	9.24	0.226 9956	241.0	5.07	5.22	0 47.3
	8	5	53	53.67	13.433	24	8	48.9	7.46	0.226 4095	247.5	5.07	5.22	0 48.8
	9	5	59	16.15	13.440	24	11	26.5	5.68	0.225 8078	253.9	5.08	5.23	0 50.2
	10	6	4	38.79	13.446	24	13	21.3	3.89	0.225 1906	260.4	5.09	5.24	0 51.6
	11	6	10	1.52	+13.448	+24	14	33.1	+ 2.09	0.224 5576	-267.0	5.10	5.25	0 53.1
	12	6	15	24.29	13.449	24	15	1.8	+ 0.30	0.223 9088	273.6	5.10	5.25	0 54.5
	13	6	20	47.03	13.446	24	14	47.4	- 1.50	0.223 2441	280.3	5.11	5.26	0 55.9
	14	6	26	9.68	13.441	24	13	49.9	3.29	0.222 5633	287.0	5.12	5.27	0 57.4
	15	6	31	32.18	13.433	24	12	9.3	5.09	0.221 8664	293.8	5.13	5.28	0 58.8
	16	6	36	54.46	+13.423	+24	9	45.7	- 6.88	0.221 1531	-300.6	5.14	5.29	1 0.2
17	6	42	16.47	13.410	24	6	39.1	8.67	0.220 4235	307.4	5.15	5.30	1 1.7	
18	6	47	38.14	13.395	24	2	49.7	10.45	0.219 6775	314.3	5.16	5.31	1 3.1	
19	6	52	59.42	13.378	23	58	17.6	12.22	0.218 9148	321.2	5.16	5.31	1 4.5	
20	6	58	20.25	13.357	23	53	3.1	13.99	0.218 1355	328.2	5.17	5.32	1 5.9	
21	7	3	40.56	+13.335	+23	47	6.2	-15.75	0.217 3395	-335.1	5.18	5.33	1 7.3	
22	7	9	0.30	13.310	23	40	27.4	17.49	0.216 5268	342.1	5.19	5.34	1 8.7	
23	7	14	19.40	13.282	23	33	6.8	19.22	0.215 6975	349.0	5.21	5.36	1 10.1	
24	7	19	37.81	13.252	23	25	4.8	20.94	0.214 8515	356.0	5.22	5.37	1 11.4	
25	7	24	55.49	13.220	23	16	21.7	22.64	0.213 9888	362.9	5.23	5.38	1 12.8	
26	7	30	12.37	+13.186	+23	6	58.0	-24.33	0.213 1094	-369.9	5.24	5.39	1 14.1	
27	7	35	28.42	13.151	22	56	53.9	26.01	0.212 2132	376.9	5.25	5.40	1 15.5	
28	7	40	43.58	13.113	22	46	9.9	27.66	0.211 3003	383.8	5.26	5.41	1 16.8	
29	7	45	57.82	13.073	22	34	46.5	29.29	0.210 3709	390.7	5.27	5.42	1 18.1	
30	7	51	11.08	13.032	22	22	44.0	30.91	0.209 4248	397.6	5.28	5.43	1 19.3	
July	1	7	56	23.34	+12.989	+22	10	3.0	-32.51	0.208 4622	-404.5	5.29	5.44	1 20.6
	2	8	1	34.55	+12.945	+21	56	43.9	-34.08	0.207 4831	-411.4	5.31	5.46	1 21.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July	1	7 56	23.34	+12.989	+22 10	3.0		-32.51	0.208 4622	-404.5	5.29	5.44	1 20.6
	2	8 1 34.55	12.945		21 56	43.9		34.08	0.207 4831	411.4	5.31	5.46	1 21.8
	3	8 6 44.69	12.900		21 42	47.3		35.63	0.206 4876	418.2	5.32	5.47	1 23.1
	4	8 11 53.73	12.853		21 28	13.7		37.16	0.205 4706	425.1	5.33	5.48	1 24.3
	5	8 17 1.64	12.806		21 13	3.7		38.67	0.204 4473	431.9	5.35	5.50	1 25.5
	6	8 22 8.40	+12.757	+20 57	17.7			-40.16	0.203 4027	-438.7	5.36	5.51	1 26.6
	7	8 27 13.99	12.708		20 40	56.4		41.61	0.202 3416	445.5	5.37	5.52	1 27.8
	8	8 32 18.38	12.658		20 24	0.4		43.05	0.201 2641	452.4	5.38	5.54	1 28.9
	9	8 37 21.56	12.607		20 6	30.2		44.46	0.200 1701	459.3	5.39	5.55	1 30.0
	10	8 42 23.53	12.556		19 48	26.6		45.84	0.199 0595	466.2	5.40	5.56	1 31.1
	11	8 47 24.26	+12.504	+19 29	50.0			-47.20	0.197 9323	-473.2	5.42	5.58	1 32.2
	12	8 52 23.74	12.453		19 10	41.3		48.53	0.196 7893	480.2	5.43	5.59	1 33.2
	13	8 57 21.98	12.401		18 51	1.0		49.83	0.195 6275	487.2	5.45	5.61	1 34.3
	14	9 2 18.96	12.348		18 30	49.8		51.10	0.194 4497	494.3	5.46	5.62	1 35.3
	15	9 7 14.67	12.295		18 10	8.4		52.34	0.193 2548	501.4	5.48	5.64	1 36.2
	16	9 12 9.13	+12.243	+17 48	57.5			-53.56	0.192 0428	-508.6	5.49	5.65	1 37.2
	17	9 17 2.32	12.190		17 27	17.8		54.74	0.190 8135	515.8	5.51	5.67	1 38.1
	18	9 21 54.25	12.137		17 5	10.0		55.90	0.189 5669	523.0	5.53	5.69	1 39.1
	19	9 26 44.92	12.085		16 42	34.8		57.03	0.188 3029	530.3	5.54	5.70	1 40.0
	20	9 31 34.33	12.033		16 19	33.0		58.12	0.187 0215	537.5	5.56	5.72	1 40.9
	21	9 36 22.50	+11.981	+15 56	5.3			-59.19	0.185 7227	-544.8	5.58	5.74	1 41.7
	22	9 41 9.44	11.930		15 32	12.3		60.22	0.184 4064	552.1	5.59	5.75	1 42.6
	23	9 45 55.15	11.879		15 7	54.9		61.22	0.183 0726	559.4	5.61	5.77	1 43.4
	24	9 50 39.66	11.830		14 43	13.8		62.20	0.181 7213	566.7	5.63	5.79	1 44.2
	25	9 55 22.97	11.780		14 18	9.7		63.14	0.180 3525	574.0	5.65	5.81	1 44.9
	26	10 0 5.09	+11.731	+13 52	43.4			-64.05	0.178 9662	-581.3	5.67	5.83	1 45.7
	27	10 4 46.06	11.683		13 26	55.6		64.93	0.177 5624	588.5	5.69	5.85	1 46.4
	28	10 9 25.89	11.636		13 0	47.0		65.78	0.176 1412	595.8	5.71	5.87	1 47.2
	29	10 14 4.60	11.590		12 34	18.4		66.60	0.174 7025	603.1	5.72	5.88	1 47.9
	30	10 18 42.22	11.545		12 7	30.4		67.39	0.173 2464	610.3	5.73	5.90	1 48.5
	31	10 23 18.77	+11.501	+11 40	23.9			-68.15	0.171 7730	-617.5	5.75	5.92	1 49.2
Aug.	1	10 27 54.28	11.458		11 12	59.5		68.88	0.170 2825	624.6	5.78	5.95	1 49.9
	2	10 32 28.78	11.417		10 45	17.9		69.58	0.168 7748	631.8	5.80	5.97	1 50.5
	3	10 37 2.30	11.377		10 17	19.9		70.25	0.167 2500	638.9	5.82	5.99	1 51.1
	4	10 41 34.87	11.338		9 49	6.2		70.89	0.165 7081	646.0	5.84	6.01	1 51.7
	5	10 46 6.54	+11.301	+ 9 20	37.4			-71.51	0.164 1491	-653.1	5.86	6.03	1 52.3
	6	10 50 37.33	11.265		8 51	54.2		72.09	0.162 5730	660.3	5.88	6.05	1 52.9
	7	10 55 7.29	11.231		8 22	57.3		72.64	0.160 9798	667.5	5.90	6.07	1 53.4
	8	10 59 36.44	11.198		7 53	47.5		73.17	0.159 3692	674.7	5.93	6.10	1 54.0
	9	11 4 4.83	11.167		7 24	25.4		73.67	0.157 7413	682.0	5.95	6.12	1 54.5
	10	11 8 32.49	+11.138	+ 6 54	51.7			-74.14	0.156 0958	-689.3	5.97	6.14	1 55.0
	11	11 12 59.46	11.110		6 25	7.1		74.57	0.154 4326	696.7	6.00	6.17	1 55.5
	12	11 17 25.78	11.083		5 55	12.4		74.98	0.152 7517	704.1	6.02	6.19	1 56.0
	13	11 21 51.48	11.059		5 25	8.2		75.36	0.151 0530	711.5	6.04	6.21	1 56.5
	14	11 26 16.61	11.036		4 54	55.2		75.72	0.149 3363	719.0	6.07	6.24	1 57.0
	15	11 30 41.20	+11.014	+ 4 24	34.1			-76.03	0.147 6015	-726.6	6.08	6.26	1 57.4
	16	11 35 5.28	+10.993	+ 3 54	5.8			-76.32	0.145 8484	-734.2	6.11	6.29	1 57.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Aug.	16	11 35	5.28	+10.998	+ 3 54	5.8	-76.32	0.145 8484	- 734.2	6.11	6.29	1 57.9	
	17	11 39	28.90	10.975	3 23	30.8	76.59	0.144 0771	741.9	6.14	6.32	1 58.4	
	18	11 43	52.09	10.958	2 52	49.9	76.82	0.142 2874	749.6	6.16	6.34	1 58.8	
	19	11 48	14.90	10.943	2 22	3.8	77.02	0.140 4791	757.3	6.19	6.37	1 59.2	
	20	11 52	37.36	10.929	1 51	13.2	77.19	0.138 6522	765.1	6.21	6.39	1 59.7	
	21	11 56	59.51	+10.917	+ 1 20	18.8	-77.34	0.136 8066	- 772.9	6.24	6.42	2 0.1	
	22	12 1	21.38	10.906	0 49	21.3	77.45	0.134 9422	780.8	6.27	6.45	2 0.5	
	23	12 5	43.02	10.897	+ 0 18	21.3	77.54	0.133 0589	788.6	6.30	6.48	2 0.9	
	24	12 10	4.47	10.890	- 0 12	40.4	77.59	0.131 1568	796.5	6.33	6.51	2 1.3	
	25	12 14	25.76	10.884	0 43	43.0	77.62	0.129 2357	804.4	6.35	6.53	2 1.8	
Sept.	26	12 18	46.93	+10.880	- 1 14	46.0	-77.62	0.127 2957	- 812.2	6.38	6.56	2 2.2	
	27	12 23	8.03	10.878	1 45	48.6	77.59	0.125 3369	820.1	6.41	6.59	2 2.6	
	28	12 27	29.08	10.877	2 16	50.1	77.53	0.123 3591	828.0	6.43	6.62	2 3.0	
	29	12 31	50.13	10.878	2 47	49.8	77.44	0.121 3625	835.9	6.46	6.65	2 3.4	
	30	12 36	11.22	10.880	3 18	47.1	77.33	0.119 3469	843.7	6.49	6.68	2 3.8	
	31	12 40	32.39	+10.884	- 3 49	41.3	-77.18	0.117 3125	- 851.6	6.53	6.72	2 4.2	
	1	12 44	53.68	10.890	4 20	31.7	77.01	0.115 2591	859.5	6.56	6.75	2 4.6	
	2	12 49	15.14	10.898	4 51	17.6	76.81	0.113 1869	867.4	6.59	6.78	2 5.0	
	3	12 53	36.81	10.908	5 21	58.4	76.58	0.111 0957	875.3	6.62	6.81	2 5.5	
	4	12 57	58.72	10.919	5 52	33.4	76.33	0.108 9856	883.2	6.66	6.85	2 5.9	
	5	13 2	20.93	+10.932	- 6 23	2.0	-76.05	0.106 8562	- 891.2	6.69	6.88	2 6.3	
	6	13 6	43.46	10.946	6 53	23.5	75.74	0.104 7077	899.2	6.72	6.91	2 6.7	
	7	13 11	6.37	10.963	7 23	37.2	75.40	0.102 5398	907.4	6.76	6.95	2 7.2	
	8	13 15	29.70	10.981	7 53	42.3	75.03	0.100 3522	915.6	6.78	6.98	2 7.6	
	9	13 19	53.47	11.000	8 23	38.2	74.63	0.098 1448	923.9	6.82	7.02	2 8.1	
	10	13 24	17.73	+11.022	- 8 53	24.2	-74.20	0.095 9174	- 932.3	6.85	7.05	2 8.6	
	11	13 28	42.52	11.044	9 22	59.6	73.74	0.093 6697	940.8	6.89	7.09	2 9.0	
	12	13 33	7.87	11.068	9 52	23.7	73.26	0.091 4016	949.4	6.93	7.13	2 9.5	
	13	13 37	33.81	11.093	10 21	35.7	72.74	0.089 1129	958.0	6.97	7.17	2 10.0	
	14	13 42	0.37	11.120	10 50	34.9	72.19	0.086 8032	966.7	7.00	7.20	2 10.5	
15	13 46	27.00	+11.149	-11 19	20.7	-71.62	0.084 4725	- 975.6	7.04	7.24	2 11.0		
16	13 50	55.52	11.178	11 47	52.4	71.01	0.082 1204	984.5	7.08	7.28	2 11.5		
17	13 55	24.15	11.208	12 16	9.1	70.37	0.079 7468	993.5	7.12	7.32	2 12.1		
18	13 59	53.52	11.240	12 44	10.1	69.71	0.077 3514	1002.7	7.15	7.36	2 12.6		
19	14 4	23.66	11.272	13 11	54.8	69.01	0.074 9339	1011.9	7.19	7.40	2 13.2		
20	14 8	54.59	+11.306	-13 39	22.3	-68.28	0.072 4943	-1021.2	7.24	7.45	2 13.7		
21	14 13	26.34	11.340	14 6	31.9	67.52	0.070 0322	1030.6	7.28	7.49	2 14.3		
22	14 17	58.92	11.375	14 33	23.0	66.73	0.067 5476	1040.0	7.32	7.53	2 14.9		
23	14 22	32.36	11.411	14 59	54.8	65.91	0.065 0403	1049.4	7.37	7.58	2 15.6		
24	14 27	6.67	11.448	15 26	6.6	65.06	0.062 5102	1059.0	7.41	7.62	2 16.2		
25	14 31	41.87	+11.485	-15 51	57.6	-64.18	0.059 9570	-1068.7	7.45	7.67	2 16.8		
26	14 36	17.97	11.523	16 17	27.1	63.27	0.057 3806	1078.4	7.49	7.71	2 17.5		
27	14 40	54.99	11.562	16 42	34.4	62.33	0.054 7809	1088.1	7.54	7.76	2 18.2		
28	14 45	32.95	11.601	17 7	18.8	61.36	0.052 1579	1097.8	7.58	7.80	2 18.9		
29	14 50	11.84	11.640	17 31	39.5	60.36	0.049 5116	1107.5	7.63	7.85	2 19.6		
30	14 54	51.69	+11.680	-17 55	35.9	-59.33	0.046 8417	-1117.3	7.68	7.90	2 20.3		
Oct.	1	14 59	32.50	+11.721	-18 19	7.3	-58.28	0.044 1483	-1127.2	7.73	7.95	2 21.0	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	h m
Oct.	1	h	m	s	s	°	'	"	"		"	"	h m
	14 59 32.50	+11.721	-18 19 7.3	-58.28	0.044 1483	-1127.2	7.73	7.95	2 21.0				
	15 4 14.29	11.761	18 42 13.0	57.19	0.041 4312	1137.1	7.78	8.00	2 21.8				
	15 8 57.05	11.802	19 4 52.2	56.08	0.038 6900	1147.2	7.82	8.05	2 22.5				
	15 13 40.80	11.844	19 27 4.4	54.93	0.035 9247	1157.3	7.87	8.10	2 23.3				
	15 18 25.54	11.885	19 48 48.8	53.76	0.033 1349	1167.5	7.92	8.15	2 24.2				
	15 23 11.26	+11.926	-20 10 4.8	-52.56	0.030 3204	-1177.9	7.98	8.21	2 25.0				
	15 27 57.97	11.967	20 30 51.5	51.33	0.027 4808	1188.4	8.03	8.26	2 25.8				
	15 32 45.66	12.007	20 51 8.5	50.08	0.024 6158	1199.1	8.08	8.31	2 26.7				
	15 37 34.32	12.048	21 10 55.0	48.80	0.021 7251	1209.9	8.14	8.37	2 27.5				
	15 42 23.94	12.087	21 30 10.5	47.49	0.018 8082	1220.9	8.19	8.43	2 28.4				
	15 47 14.51	+12.126	-21 48 54.1	-46.15	0.015 8648	-1232.0	8.24	8.48	2 29.3				
	15 52 5.99	12.164	22 7 5.3	44.79	0.012 8944	1243.3	8.30	8.54	2 30.2				
	15 56 58.37	12.201	22 24 43.5	43.40	0.009 8966	1254.8	8.36	8.60	2 31.2				
	16 1 51.62	12.237	22 41 48.1	41.98	0.006 8710	1266.5	8.42	8.66	2 32.1				
	16 6 45.72	12.271	22 58 18.3	40.54	0.003 8171	1278.4	8.48	8.72	2 33.1				
	16 11 40.62	+12.304	-23 14 13.8	-39.08	0.000 7347	-1290.3	8.53	8.78	2 34.1				
	16 16 36.31	12.336	23 29 33.9	37.59	9.997 6233	1302.5	8.60	8.85	2 35.1				
	16 21 32.72	12.365	23 44 18.0	36.08	9.994 4824	1314.9	8.66	8.91	2 36.1				
	16 26 29.83	12.393	23 58 25.6	34.55	9.991 3116	1327.5	8.73	8.98	2 37.1				
	16 31 27.57	12.418	24 11 56.2	33.00	9.988 1104	1340.2	8.79	9.04	2 38.1				
	16 36 25.90	+12.442	-24 24 49.4	-31.43	9.984 8785	-1353.1	8.85	9.11	2 39.1				
	16 41 24.76	12.463	24 37 4.7	29.84	9.981 6155	1366.1	8.92	9.18	2 40.2				
	16 46 24.09	12.481	24 48 41.7	28.24	9.978 3210	1379.3	8.99	9.25	2 41.2				
	16 51 23.83	12.497	24 59 39.9	26.61	9.974 9948	1392.6	9.06	9.32	2 42.2				
	16 56 23.93	12.511	25 9 59.0	24.97	9.971 6364	1406.1	9.13	9.39	2 43.3				
	17 1 24.33	+12.522	-25 19 38.6	-23.32	9.968 2456	-1419.6	9.20	9.47	2 44.4				
	17 6 24.96	12.530	25 28 38.5	21.66	9.964 8221	1433.3	9.27	9.54	2 45.4				
	17 11 25.73	12.535	25 36 58.3	19.99	9.961 3658	1447.0	9.35	9.62	2 46.5				
	17 16 26.60	12.537	25 44 37.8	18.30	9.957 8763	1460.9	9.43	9.70	2 47.6				
	17 21 27.49	12.537	25 51 36.7	16.61	9.954 3532	1475.0	9.51	9.78	2 48.7				
17 26 28.34	+12.533	-25 57 54.9	-14.91	9.950 7963	-1489.2	9.58	9.86	2 49.7					
Nov.	1	17 31 29.06	12.527	26 3 32.1	13.20	9.947 2051	1503.5	9.66	9.94	2 50.8			
	2	17 36 29.60	12.517	26 8 28.3	11.48	9.943 5793	1518.0	9.74	10.02	2 51.9			
	3	17 41 29.87	12.505	26 12 43.3	9.76	9.939 9183	1532.8	9.83	10.11	2 52.9			
	4	17 46 29.80	12.489	26 16 17.0	8.04	9.936 2217	1547.7	9.90	10.19	2 54.0			
	5	17 51 29.31	+12.470	-26 19 9.3	-6.32	9.932 4890	-1562.9	9.99	10.28	2 55.0			
	6	17 56 28.33	12.448	26 21 20.4	4.60	9.928 7195	1578.4	10.08	10.37	2 56.1			
	7	18 1 26.78	12.422	26 22 50.2	2.88	9.924 9127	1594.0	10.17	10.46	2 57.1			
	8	18 6 24.58	12.393	26 23 38.7	-1.16	9.921 0680	1609.9	10.25	10.55	2 58.1			
	9	18 11 21.63	12.361	26 23 46.1	+0.55	9.917 1847	1626.2	10.35	10.65	2 59.1			
	10	18 16 17.86	+12.325	-26 23 12.5	+2.25	9.913 2622	-1642.7	10.45	10.75	3 0.1			
	11	18 21 13.18	12.285	26 21 58.1	3.95	9.909 2997	1659.5	10.54	10.84	3 1.1			
	12	18 26 7.50	12.241	26 20 3.0	5.64	9.905 2965	1676.6	10.63	10.94	3 2.1			
	13	18 31 0.74	12.195	26 17 27.5	7.32	9.901 2520	1693.9	10.74	11.05	3 3.0			
	14	18 35 52.81	12.144	26 14 11.0	8.98	9.897 1655	1711.5	10.84	11.15	3 3.9			
	15	18 40 43.61	+12.089	-26 10 16.4	+10.63	9.893 0363	-1729.6	10.94	11.26	3 4.8			
	16	18 45 33.07	+12.031	-26 5 41.6	+12.27	9.888 8634	-1747.9	11.05	11.37	3 5.7			

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Nov. 16	18 45 33.07	+12.031	-26 5 41.6	+12.27	9.888 8634	-1747.9	11.05	11.37	3 5.7
17	18 50 21.07	11.989	26 0 27.6	13.89	9.884 6463	1766.5	11.16	11.48	3 6.6
18	18 55 7.54	11.903	25 54 35.0	15.49	9.880 3841	1785.4	11.27	11.59	3 7.4
19	18 59 52.39	11.833	25 48 4.3	17.07	9.876 0762	1804.6	11.38	11.71	3 8.2
20	19 4 35.51	11.760	25 40 55.9	18.63	9.871 7219	1824.0	11.49	11.82	3 9.0
21	19 9 16.82	+11.682	-25 33 10.4	+20.16	9.867 3207	-1843.7	11.61	11.94	3 9.7
22	19 13 56.23	11.601	25 24 48.3	21.67	9.862 8718	1863.7	11.73	12.07	3 10.4
23	19 18 33.64	11.516	25 15 50.3	23.16	9.858 3748	1883.8	11.85	12.19	3 11.1
24	19 23 8.97	11.428	25 6 16.9	24.62	9.853 8292	1904.2	11.98	12.32	3 11.7
25	19 27 42.14	11.336	24 56 8.8	26.05	9.849 2344	1924.8	12.10	12.45	3 12.3
26	19 32 13.06	+11.240	-24 45 26.6	+27.46	9.844 5900	-1945.6	12.24	12.59	3 12.9
27	19 36 41.64	11.141	24 34 11.0	28.84	9.839 8955	1966.5	12.36	12.72	3 13.4
28	19 41 7.82	11.040	24 22 22.7	30.18	9.835 1504	1987.7	12.50	12.86	3 13.9
29	19 45 31.52	10.935	24 10 2.5	31.50	9.830 3542	2009.1	12.65	13.01	3 14.4
30	19 49 52.65	10.826	23 57 11.0	32.79	9.825 5064	2030.7	12.78	13.15	3 14.8
Dec. 1	19 54 11.15	+10.715	-23 43 49.1	+34.04	9.820 6064	-2052.6	12.93	13.30	3 15.1
2	19 58 26.94	10.601	23 29 57.5	35.26	9.815 6536	2074.7	13.07	13.45	3 15.4
3	20 2 39.95	10.483	23 15 37.0	36.44	9.810 6474	2097.1	13.23	13.61	3 15.7
4	20 6 50.11	10.363	23 0 48.5	37.60	9.805 5871	2119.8	13.38	13.77	3 16.0
5	20 10 57.34	10.239	22 45 32.7	38.71	9.800 4721	2142.8	13.54	13.93	3 16.1
6	20 15 1.57	+10.113	-22 29 50.7	+39.79	9.795 3015	-2166.1	13.71	14.10	3 16.2
7	20 19 2.72	9.983	22 13 43.2	40.83	9.790 0748	2189.6	13.87	14.27	3 16.3
8	20 23 0.72	9.850	21 57 11.1	41.84	9.784 7912	2213.4	14.04	14.44	3 16.3
9	20 26 55.50	9.714	21 40 15.4	42.80	9.779 4500	2237.6	14.21	14.62	3 16.3
10	20 30 46.96	9.574	21 22 57.0	43.73	9.774 0504	2262.1	14.40	14.81	3 16.2
11	20 34 35.08	+9.431	-21 5 16.9	+44.61	9.768 5918	-2286.8	14.57	14.99	3 16.0
12	20 38 19.63	9.285	20 47 16.1	45.45	9.763 0735	2311.8	14.75	15.18	3 15.8
13	20 42 0.68	9.135	20 28 55.6	46.25	9.757 4948	2337.2	14.95	15.38	3 15.6
14	20 45 38.08	8.981	20 10 16.5	47.00	9.751 8549	2362.8	15.14	15.58	3 15.3
15	20 49 11.73	8.823	19 51 19.8	47.71	9.746 1534	2388.6	15.35	15.79	3 14.9
16	20 52 41.55	+8.661	-19 32 6.6	+48.37	9.740 3896	-2414.6	15.55	16.00	3 14.4
17	20 56 7.42	8.495	19 12 38.2	48.99	9.734 5632	2440.8	15.77	16.22	3 13.9
18	20 59 29.25	8.324	18 52 55.6	49.55	9.728 6738	2467.0	15.98	16.44	3 13.3
19	21 2 46.91	8.148	18 33 0.0	50.07	9.722 7214	2493.3	16.19	16.66	3 12.6
20	21 6 0.30	7.967	18 12 52.7	50.53	9.716 7059	2519.6	16.43	16.90	3 11.9
21	21 9 9.29	+7.781	-17 52 34.8	+50.95	9.710 6274	-2545.7	16.65	17.13	3 11.1
22	21 12 13.76	7.591	17 32 7.6	51.31	9.704 4865	2571.7	16.89	17.38	3 10.2
23	21 15 13.60	7.395	17 11 32.3	51.62	9.698 2835	2597.4	17.14	17.63	3 9.3
24	21 18 8.67	7.193	16 50 50.2	51.88	9.692 0193	2622.7	17.38	17.88	3 8.2
25	21 20 58.83	6.986	16 30 2.7	52.08	9.685 6947	2647.7	17.64	18.15	3 7.1
26	21 23 43.97	+6.774	-16 9 10.9	+52.23	9.679 3109	-2672.1	17.90	18.42	3 5.9
27	21 26 23.93	6.555	15 48 16.2	52.32	9.672 8692	2696.9	18.17	18.69	3 4.6
28	21 28 58.58	6.331	15 27 20.0	52.36	9.666 3713	2719.0	18.44	18.97	3 3.3
29	21 31 27.77	6.100	15 6 23.6	52.34	9.659 8186	2741.4	18.72	19.26	3 1.8
30	21 33 51.35	5.864	14 45 28.3	52.26	9.653 2132	2762.9	19.01	19.56	3 0.2
31	21 36 9.17	+5.620	-14 24 35.7	+52.12	9.646 5573	-2783.5	19.30	19.86	2 58.6
32	21 38 21.07	+5.370	-14 3 47.1	+51.92	9.639 8535	-2802.8	19.61	20.17	2 56.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Jan.	1	213 3 29.8	1 36 18.1	-3 0.5	+2 18 38.2	-4 10.7	9.858 9181	+821
	3	216 16 0.5	1 36 12.6	2 57.9	2 10 4.2	4 23.1	9.859 0828	826
	5	219 28 20.1	1 36 7.0	2 53.1	2 1 6.2	4 34.7	9.859 2482	828
	7	222 40 28.7	1 36 1.6	2 46.1	1 51 45.9	4 45.4	9.859 4138	827
	9	225 52 26.6	1 35 56.2	2 37.0	1 42 5.2	4 55.2	9.859 5790	824
	11	229 4 13.7	1 35 50.9	-2 26.0	+1 32 5.8	-5 4.0	9.859 7434	+819
	13	232 15 50.4	1 35 45.8	2 13.2	1 21 49.8	5 11.9	9.859 9063	810
	15	235 27 16.9	1 35 40.7	1 58.7	1 11 18.9	5 18.8	9.860 0673	800
	17	238 38 33.3	1 35 35.8	1 42.8	1 0 35.3	5 24.7	9.860 2260	787
	19	241 49 40.2	1 35 31.1	1 25.6	0 49 40.9	5 29.6	9.860 3818	771
	21	245 0 38.0	1 35 26.6	-1 7.4	+0 38 37.7	-5 33.4	9.860 5342	+753
	23	248 11 26.9	1 35 22.4	0 48.4	0 27 27.9	5 36.2	9.860 6828	733
	25	251 22 7.6	1 35 18.3	0 28.8	0 16 13.5	5 38.0	9.860 8271	710
	27	254 32 40.4	1 35 14.5	-0 8.8	+0 4 56.5	5 38.8	9.860 9667	686
	29	257 43 5.8	1 35 11.0	+0 11.3	-0 6 20.9	5 38.5	9.861 1012	659
	31	260 53 24.5	1 35 7.8	+0 31.2	-0 17 36.8	-5 37.2	9.861 2302	+631
Feb.	2	264 3 37.0	1 35 4.8	0 50.7	0 28 49.1	5 34.9	9.861 3533	600
	4	267 13 43.7	1 35 2.1	1 9.6	0 39 55.7	5 31.5	9.861 4700	567
	6	270 23 45.4	1 34 59.7	1 27.6	0 50 54.6	5 27.2	9.861 5801	533
	8	273 33 42.5	1 34 57.5	1 44.6	1 1 43.8	5 21.9	9.861 6832	498
	10	276 43 35.7	1 34 55.7	+2 0.2	-1 12 21.5	-5 15.6	9.861 7790	+480
	12	279 53 25.6	1 34 54.2	2 14.4	1 22 45.7	5 8.4	9.861 8671	422
	14	283 3 12.6	1 34 52.9	2 27.0	1 32 54.6	5 0.3	9.861 9476	382
	16	286 12 57.4	1 34 52.0	2 37.7	1 42 46.2	4 51.2	9.862 0199	341
	18	289 22 40.6	1 34 51.3	2 46.6	1 52 18.9	4 41.3	9.862 0840	299
	20	292 32 22.6	1 34 50.8	+2 53.4	-2 1 30.9	-4 30.6	9.862 1396	+256
	22	295 42 4.1	1 34 50.7	2 58.1	2 10 20.7	4 19.0	9.862 1865	213
	24	298 51 45.5	1 34 50.8	3 0.6	2 18 46.5	4 6.7	9.862 2246	168
	26	302 1 27.4	1 34 51.1	3 0.9	2 26 47.0	3 53.6	9.862 2538	124
	28	305 11 10.1	1 34 51.7	2 59.0	2 34 20.6	3 39.9	9.862 2741	79
Mar.	2	308 20 54.2	1 34 52.5	+2 55.0	-2 41 26.0	-3 26.5	9.862 2853	+ 33
	4	311 30 40.1	1 34 53.4	2 48.8	2 48 2.0	3 10.4	9.862 2874	- 12
	6	314 40 28.1	1 34 54.6	2 40.5	2 54 7.3	2 54.8	9.862 2805	57
	8	317 50 18.7	1 34 56.0	2 30.3	2 59 40.8	2 38.7	9.862 2645	103
	10	321 0 12.3	1 34 57.5	2 18.3	3 4 41.6	2 22.0	9.862 2395	147
	12	324 10 9.0	1 34 59.2	+2 4.6	-3 9 8.6	-2 4.9	9.862 2056	-192
	14	327 20 9.3	1 35 1.1	1 49.4	3 13 1.1	1 47.5	9.862 1628	236
	16	330 30 13.4	1 35 3.1	1 32.8	3 16 18.3	1 29.7	9.862 1112	279
	18	333 40 21.6	1 35 5.2	1 15.1	3 18 59.7	1 11.6	9.862 0511	321
	20	336 50 34.1	1 35 7.4	0 56.4	3 21 4.6	0 53.3	9.861 9827	363
	22	340 0 51.1	1 35 9.6	+0 37.1	-3 22 32.8	-0 34.8	9.861 9061	-403
	24	343 11 12.7	1 35 12.0	+0 17.3	3 23 23.8	-0 16.2	9.861 8215	442
	26	346 21 39.2	1 35 14.5	-0 2.7	3 23 37.5	+0 2.5	9.861 7292	481
	28	349 32 10.8	1 35 17.1	0 22.7	3 23 13.8	0 21.2	9.861 6294	517
	30	352 42 47.5	1 35 19.7	0 42.4	3 22 12.7	0 39.9	9.861 5226	551
Apr.	1	355 53 29.5	1 35 22.4	-1 1.6	-3 20 34.3	+0 58.5	9.861 4090	-584
	3	359 4 17.0	1 35 25.1	-1 20.1	-3 18 18.9	+1 16.9	9.861 2889	-616

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Apr.	1	355 53 29.5	1 35 22.4	-1 1.6	-3 20 34.3	+0 58.5	9.861 4090	-584
	3	359 4 17.0	1 35 25.1	1 20.1	3 18 18.9	1 16.9	9.861 2889	616
	5	2 15 9.9	1 35 27.9	1 37.6	3 15 26.9	1 35.1	9.861 1627	646
	7	5 26 8.5	1 35 30.7	1 53.8	3 11 53.6	1 53.1	9.861 0307	674
	9	8 37 12.7	1 35 33.5	2 8.7	3 7 54.6	2 10.8	9.860 8934	699
	11	11 48 22.7	1 35 36.5	-2 22.1	-3 3 15.8	+2 28.0	9.860 7513	-722
	13	14 59 38.6	1 35 39.4	2 33.7	2 58 2.9	2 44.9	9.860 6046	744
	15	18 11 0.5	1 35 42.5	2 43.3	2 52 16.7	3 1.2	9.860 4540	763
	17	21 22 28.5	1 35 45.5	2 51.0	2 45 58.3	3 17.1	9.860 2997	779
	19	24 34 2.5	1 35 48.6	2 56.5	2 39 8.7	3 32.4	9.860 1424	794
	21	27 45 42.8	1 35 51.7	-2 59.9	-2 31 49.2	+3 47.0	9.859 9824	-806
	23	30 57 29.4	1 35 54.9	3 1.0	2 24 1.0	4 1.0	9.859 8203	815
	25	34 9 22.4	1 35 58.1	2 59.9	2 15 45.7	4 14.2	9.859 6566	822
	27	37 21 21.8	1 36 1.3	2 56.5	2 7 4.6	4 26.7	9.859 4918	826
	29	40 33 27.8	1 36 4.7	2 51.0	1 57 59.4	4 38.4	9.859 3265	827
May	1	43 45 40.5	1 36 8.0	-2 43.3	-1 48 31.6	+4 49.3	9.859 1611	-826
	3	46 57 59.9	1 36 11.4	2 33.5	1 38 43.0	4 59.2	9.858 9961	823
	5	50 10 26.1	1 36 14.8	2 21.8	1 28 35.5	5 8.2	9.858 8320	817
	7	53 22 59.1	1 36 18.3	2 8.3	1 18 10.8	5 16.3	9.858 6694	808
	9	56 35 39.2	1 36 21.8	1 53.2	1 7 31.0	5 23.4	9.858 5089	797
	11	59 48 26.4	1 36 25.4	-1 36.7	-0 56 37.9	+5 29.5	9.858 3508	-783
	13	63 1 20.7	1 36 28.9	1 18.9	0 45 33.7	5 34.6	9.858 1957	767
	15	66 14 22.2	1 36 32.5	1 0.1	0 34 20.4	5 38.6	9.858 0441	748
	17	69 27 30.8	1 36 36.1	0 40.6	0 23 0.1	5 41.5	9.857 8965	727
	19	72 40 46.8	1 36 39.8	0 20.5	0 11 35.0	5 43.4	9.857 7534	704
	21	75 54 10.0	1 36 43.4	-0 0.2	-0 0 7.3	+5 44.1	9.857 6152	-678
	23	79 7 40.5	1 36 47.0	+0 20.2	+0 11 20.8	5 43.8	9.857 4824	650
	25	82 21 18.1	1 36 50.6	0 40.3	0 22 47.3	5 42.4	9.857 3553	620
	27	85 35 2.9	1 36 54.2	0 59.9	0 34 9.8	5 39.9	9.857 2344	588
	29	88 48 54.8	1 36 57.7	1 18.7	0 45 26.1	5 36.3	9.857 1202	554
	31	92 2 53.6	1 37 1.1	+1 36.6	+0 56 34.1	+5 31.5	9.857 0129	-519
June	2	95 16 59.1	1 37 4.4	1 53.3	1 7 31.5	5 25.7	9.856 9128	481
	4	98 31 11.3	1 37 7.7	2 8.5	1 18 16.4	5 18.9	9.856 8205	442
	6	101 45 29.8	1 37 10.8	2 22.0	1 28 46.6	5 11.0	9.856 7360	402
	8	104 59 54.5	1 37 13.8	2 33.8	1 39 0.0	5 2.1	9.856 6599	360
	10	108 14 25.0	1 37 16.7	+2 43.6	+1 48 54.5	+4 52.3	9.856 5922	-317
	12	111 29 1.0	1 37 19.3	2 51.3	1 58 28.4	4 41.4	9.856 5332	273
	14	114 43 42.1	1 37 21.8	2 56.8	2 7 39.6	4 29.6	9.856 4831	228
	16	117 58 28.0	1 37 24.0	3 0.1	2 16 26.4	4 17.0	9.856 4420	183
	18	121 13 18.1	1 37 26.0	3 1.0	2 24 47.0	4 3.5	9.856 4101	136
	20	124 28 12.0	1 37 27.8	+2 59.6	+2 32 39.8	+3 49.2	9.856 3875	-90
	22	127 43 9.2	1 37 29.3	2 55.9	2 40 3.2	3 34.1	9.856 3743	-42
	24	130 58 9.1	1 37 30.6	2 50.0	2 46 55.9	3 18.4	9.856 3706	+5
	26	134 13 11.2	1 37 31.5	2 41.9	2 53 16.3	3 2.0	9.856 3762	52
	28	137 28 14.7	1 37 32.1	2 31.6	2 59 3.4	2 45.0	9.856 3912	99
	30	140 43 19.2	1 37 32.3	+2 19.5	+3 4 15.9	+2 27.4	9.856 4156	+145
July	2	143 58 23.8	1 37 32.2	+2 5.5	+3 8 52.8	+2 9.4	9.856 4493	+192

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
July	2	143 58 23.8	1 37 32.2	+2 5.5	+3 8 52.8	+2 9.4	9.856 4493	+192
	4	147 13 28.0	1 37 31.9	1 49.9	3 12 53.3	1 51.0	9.856 4922	237
	6	150 28 31.1	1 37 31.1	1 33.0	3 16 16.6	1 32.2	9.856 5440	281
	8	153 43 32.3	1 37 30.0	1 14.8	3 19 2.0	1 13.1	9.856 6047	325
	10	156 58 31.0	1 37 28.6	0 55.7	3 21 9.0	0 53.8	9.856 6740	368
	12	160 13 26.5	1 37 26.8	+0 35.8	+3 22 37.3	+0 34.4	9.856 7517	+409
	14	163 28 18.0	1 37 24.7	+0 15.6	3 23 26.6	+0 14.9	9.856 8376	450
	16	166 43 4.9	1 37 22.2	-0 4.9	3 23 36.8	-0 4.7	9.856 9314	488
	18	169 57 46.4	1 37 19.3	0 25.3	3 23 7.9	0 24.2	9.857 0327	525
	20	173 12 22.0	1 37 16.2	0 45.4	3 22 0.0	0 43.6	9.857 1418	561
	22	176 26 51.0	1 37 12.8	-1 4.9	+3 20 13.4	-1 2.9	9.857 2568	+594
	24	179 41 12.8	1 37 9.0	1 23.5	3 17 48.6	1 21.9	9.857 3788	626
	26	182 55 26.8	1 37 5.0	1 41.1	3 14 46.1	1 40.6	9.857 5069	655
	28	186 9 32.5	1 37 0.7	1 57.4	3 11 6.5	1 59.0	9.857 6407	683
Aug.	30	189 23 29.4	1 36 56.2	2 12.1	3 6 50.6	2 16.9	9.857 7798	708
	1	192 37 17.0	1 36 51.4	-2 25.2	+3 1 59.4	-2 34.3	9.857 9237	+731
	3	195 50 55.0	1 36 46.5	2 36.4	2 56 33.8	2 51.2	9.858 0719	751
	5	199 4 22.9	1 36 41.4	2 45.7	2 50 34.9	3 7.6	9.858 2240	769
	7	202 17 40.5	1 36 36.2	2 52.8	2 44 3.9	3 23.3	9.858 3795	785
	9	205 30 47.6	1 36 30.9	2 57.8	2 37 2.2	3 38.3	9.858 5379	799
	11	208 43 43.9	1 36 25.5	-3 0.5	+2 29 31.1	-3 52.7	9.858 6988	+809
	13	211 56 29.4	1 36 20.0	3 0.9	2 21 32.1	4 6.2	9.858 8615	817
	15	215 9 3.8	1 36 14.5	2 59.1	2 13 6.9	4 18.9	9.859 0255	823
	17	218 21 27.3	1 36 9.0	2 55.0	2 4 17.1	4 30.8	9.859 1904	826
	19	221 33 39.9	1 36 3.5	2 48.8	1 55 4.4	4 41.8	9.859 3556	826
	21	224 45 41.5	1 35 58.1	-2 40.4	+1 45 30.7	-4 51.9	9.859 5207	+824
	23	227 57 32.4	1 35 52.8	2 30.1	1 35 37.6	5 1.0	9.859 6850	819
	25	231 9 12.7	1 35 47.6	2 17.9	1 25 27.2	5 9.2	9.859 8482	812
Sept.	27	234 20 42.8	1 35 42.5	2 4.0	1 15 1.3	5 16.5	9.860 0097	802
	29	237 32 2.8	1 35 37.5	1 48.5	1 4 21.9	5 22.7	9.860 1689	790
	31	240 43 13.1	1 35 32.8	-1 31.8	+0 53 31.1	-5 27.9	9.860 3255	+775
	2	243 54 14.1	1 35 28.2	1 13.9	0 42 30.8	5 32.2	9.860 4789	758
	4	247 5 6.2	1 35 23.9	0 55.1	0 31 23.1	5 35.4	9.860 6286	739
	6	250 15 49.9	1 35 19.8	0 35.7	0 20 10.0	5 37.6	9.860 7742	717
	8	253 26 25.5	1 35 15.9	-0 15.8	+0 8 53.6	5 38.6	9.860 9152	693
	10	256 36 53.7	1 35 12.3	+0 4.3	-0 2 23.9	-5 38.7	9.861 0512	+667
	12	259 47 15.0	1 35 9.0	0 24.3	0 13 40.6	5 37.8	9.861 1819	639
	14	262 57 29.7	1 35 5.9	0 44.0	0 24 54.4	5 35.8	9.861 3068	610
	16	266 7 38.7	1 35 3.1	1 3.1	0 36 3.2	5 32.8	9.861 4256	578
	18	269 17 42.2	1 35 0.6	1 21.4	0 47 5.1	5 28.9	9.861 5378	544
	20	272 27 41.1	1 34 58.4	+1 38.8	-0 57 58.0	-5 23.9	9.861 6432	+509
	22	275 37 35.8	1 34 56.4	1 54.9	1 8 39.9	5 17.9	9.861 7414	473
Oct.	24	278 47 27.0	1 34 54.8	2 9.6	1 19 9.1	5 11.0	9.861 8322	435
	26	281 57 15.2	1 34 53.5	2 22.8	1 29 23.5	5 3.2	9.861 9152	395
	28	285 7 1.1	1 34 52.4	2 34.2	1 39 21.4	4 54.5	9.861 9902	355
	30	288 16 45.0	1 34 51.6	+2 43.7	-1 49 1.0	-4 44.9	9.862 0571	+313
	2	291 26 27.6	1 34 51.1	+2 51.2	-1 58 20.4	-4 34.4	9.862 1155	+271

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Oct.	2	291 26 27.6	1 34 51.1	+2 51.2	-1 58 20.4	-4 34.4	9.862 1155	+271
	4	294 36 9.6	1 34 50.8	2 56.6	2 7 18.2	4 23.2	9.862 1654	228
	6	297 45 51.2	1 34 50.8	2 59.9	2 15 52.6	4 11.1	9.862 2066	184
	8	300 55 33.1	1 34 51.1	3 1.0	2 24 2.1	3 58.3	9.862 2389	139
	10	304 5 15.8	1 34 51.6	2 59.9	2 31 45.2	3 44.8	9.862 2622	94
	12	307 14 59.6	1 34 52.3	+2 56.6	-2 39 0.6	-3 30.6	9.862 2766	+ 49
	14	310 24 45.2	1 34 53.3	2 51.2	2 45 47.0	3 15.7	9.862 2819	+ 4
	16	313 34 32.8	1 34 54.3	2 43.6	2 52 3.2	3 0.3	9.862 2781	- 41
	18	316 44 22.7	1 34 55.6	2 34.1	2 57 48.0	2 44.4	9.862 2653	87
	20	319 54 15.5	1 34 57.1	2 22.7	3 3 0.3	2 27.9	9.862 2434	132
	22	323 4 11.3	1 34 58.8	+2 9.6	-3 7 39.2	-2 11.0	9.862 2126	-176
	24	326 14 10.6	1 35 0.6	1 54.8	3 11 43.9	1 53.6	9.862 1730	220
	26	329 24 13.6	1 35 2.5	1 38.7	3 15 13.5	1 35.9	9.862 1245	264
	28	332 34 20.6	1 35 4.5	1 21.4	3 18 7.5	1 18.0	9.862 0675	306
	30	335 44 31.8	1 35 6.7	1 3.0	3 20 25.2	0 59.7	9.862 0020	348
Nov.	1	338 54 47.4	1 35 8.9	+0 43.9	-3 22 6.3	-0 41.3	9.861 9283	-389
	3	342 5 7.6	1 35 11.3	0 24.3	3 23 10.3	0 22.7	9.861 8466	428
	5	345 15 32.6	1 35 13.8	+0 4.3	3 23 37.1	-0 4.0	9.861 7571	467
	7	348 26 2.7	1 35 16.3	-0 15.7	3 23 26.4	+0 14.7	9.861 6600	504
	9	351 36 37.8	1 35 18.9	0 35.6	3 22 38.4	0 33.4	9.861 5557	539
	11	354 47 18.2	1 35 21.5	-0 55.0	-3 21 13.0	+0 52.0	9.861 4444	-573
	13	357 58 4.0	1 35 24.2	1 13.7	3 19 10.5	1 10.5	9.861 3266	605
	15	1 8 55.2	1 35 27.0	1 31.6	3 16 31.2	1 28.8	9.861 2025	635
	17	4 19 51.9	1 35 29.8	1 48.3	3 13 15.5	1 46.9	9.861 0726	663
	19	7 30 54.3	1 35 32.7	2 3.7	3 9 23.9	2 4.6	9.860 9373	690
	21	10 42 2.6	1 35 35.6	-2 17.6	-3 4 57.2	+2 22.0	9.860 7968	-714
	23	13 53 16.6	1 35 38.5	2 29.8	2 59 56.1	2 39.0	9.860 6517	736
	25	17 4 36.6	1 35 41.5	2 40.2	2 54 21.4	2 55.6	9.860 5025	756
	27	20 16 2.6	1 35 44.5	2 48.6	2 48 14.1	3 11.7	9.860 3495	774
	29	23 27 34.7	1 35 47.6	2 54.9	2 41 35.2	3 27.1	9.860 1932	789
Dec.	1	26 39 13.0	1 35 50.7	-2 59.0	-2 34 26.0	+3 42.0	9.860 0342	-801
	3	29 50 57.6	1 35 53.9	3 0.9	2 28 47.7	3 56.2	9.859 8729	812
	5	33 2 48.5	1 35 57.1	3 0.6	2 18 41.7	4 9.7	9.859 7097	820
	7	36 14 45.9	1 36 0.3	2 58.0	2 10 9.4	4 22.5	9.859 5453	824
	9	39 26 49.8	1 36 3.6	2 53.2	2 1 12.4	4 34.4	9.859 3802	827
	11	42 39 0.3	1 36 6.9	-2 46.2	-1 51 52.2	+4 45.6	9.859 2148	-827
	13	45 51 17.5	1 36 10.3	2 37.1	1 42 10.7	4 55.8	9.859 0496	824
	15	49 3 41.6	1 36 13.7	2 26.1	1 32 9.5	5 5.2	9.858 8852	819
	17	52 16 12.4	1 36 17.2	2 13.2	1 21 50.6	5 13.6	9.858 7221	811
	19	55 28 50.3	1 36 20.7	1 58.7	1 11 15.9	5 21.0	9.858 5608	801
	21	58 41 35.2	1 36 24.2	-1 42.6	-1 0 27.2	+5 27.5	9.858 4019	-788
	23	61 54 27.3	1 36 27.8	1 25.3	0 49 26.6	5 32.9	9.858 2458	773
	25	65 7 26.4	1 36 31.4	1 6.8	0 38 16.2	5 37.3	9.858 0930	755
	27	68 20 32.8	1 36 35.0	0 47.5	0 26 58.1	5 40.6	9.857 9441	734
	29	71 33 46.5	1 36 38.7	0 27.6	0 15 34.4	5 42.9	9.857 7995	712
	31	74 47 7.4	1 36 42.3	-0 7.3	-0 4 7.4	+5 44.0	9.857 6596	-687
	33	78 0 35.5	1 36 45.9	+0 13.1	+0 7 20.9	+5 44.0	9.857 5250	-659

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit. Meridian of Greenwich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m	
Jan.	1	19	43	7.78	+8.316	-22	25	0.4	+19.91	0.368 8986	+68.1	2.16	3.76	1	0.8
	2	19	46	27.23	8.305	22	16	55.0	20.54	0.369 0607	67.0	2.16	3.76	1	0.2
	3	19	49	46.41	8.293	22	8	34.4	21.17	0.369 2203	66.0	2.16	3.76	0	59.6
	4	19	53	5.31	8.282	21	59	58.7	21.80	0.369 3776	65.0	2.16	3.76	0	59.0
	5	19	56	23.93	8.270	21	51	8.0	22.42	0.369 5325	64.1	2.16	3.76	0	58.3
	6	19	59	42.26	+8.257	-21	42	2.5	+23.04	0.369 6851	+63.1	2.16	3.76	0	57.7
	7	20	3	0.28	8.244	21	32	42.3	23.65	0.369 8356	62.2	2.15	3.75	0	57.1
	8	20	6	17.98	8.231	21	23	7.5	24.25	0.369 9839	61.4	2.15	3.75	0	56.4
	9	20	9	35.36	8.218	21	13	18.2	24.85	0.370 1303	60.6	2.15	3.75	0	55.8
	10	20	12	52.42	8.204	21	3	14.6	25.45	0.370 2746	59.7	2.15	3.75	0	55.1
	11	20	16	9.13	+8.189	-20	52	56.8	+26.04	0.370 4169	+58.9	2.15	3.75	0	54.4
	12	20	19	25.50	8.175	20	42	24.8	26.62	0.370 5573	58.1	2.15	3.75	0	53.8
	13	20	22	41.51	8.160	20	31	39.0	27.19	0.370 6958	57.3	2.15	3.75	0	53.1
	14	20	25	57.17	8.145	20	20	39.4	27.77	0.370 8323	56.5	2.15	3.75	0	52.4
	15	20	29	12.46	8.129	20	9	26.3	28.33	0.370 9668	55.7	2.15	3.75	0	51.7
	16	20	32	27.38	+8.114	-19	57	59.6	+28.89	0.371 0995	+54.9	2.15	3.74	0	51.0
	17	20	35	41.91	8.098	19	46	19.7	29.44	0.371 2302	54.0	2.15	3.74	0	50.3
	18	20	38	56.06	8.082	19	34	26.6	29.98	0.371 3589	53.2	2.15	3.74	0	49.6
	19	20	42	9.82	8.065	19	22	20.6	30.52	0.371 4857	52.4	2.15	3.74	0	48.9
	20	20	45	23.18	8.048	19	10	1.8	31.05	0.371 6105	51.6	2.15	3.74	0	48.2
	21	20	48	36.14	+8.032	-18	57	30.3	+31.57	0.371 7334	+50.8	2.15	3.74	0	47.5
	22	20	51	48.70	8.015	18	44	46.4	32.08	0.371 8541	49.9	2.15	3.74	0	46.7
	23	20	55	0.84	7.997	18	31	50.3	32.59	0.371 9728	49.0	2.15	3.74	0	46.0
	24	20	58	12.55	7.979	18	18	42.2	33.09	0.372 0894	48.2	2.15	3.74	0	45.3
	25	21	1	23.84	7.961	18	5	22.2	33.58	0.372 2041	47.3	2.14	3.73	0	44.5
	26	21	4	34.70	+7.943	-17	51	50.6	+34.06	0.372 3166	+46.5	2.14	3.73	0	43.7
	27	21	7	45.11	7.925	17	38	7.5	34.53	0.372 4274	45.8	2.14	3.73	0	43.0
	28	21	10	55.09	7.907	17	24	13.3	34.99	0.372 5363	45.0	2.14	3.73	0	42.2
	29	21	14	4.62	7.888	17	10	8.0	35.45	0.372 6436	44.3	2.14	3.73	0	41.4
	30	21	17	13.71	7.869	16	55	51.8	35.90	0.372 7492	43.7	2.14	3.73	0	40.6
31	21	20	22.35	+7.851	-16	41	25.0	+36.34	0.372 8534	+43.1	2.14	3.73	0	39.8	
Feb.	1	21	23	30.54	7.832	16	26	47.8	36.77	0.372 9561	42.5	2.14	3.73	0	39.0
	2	21	26	38.29	7.814	16	12	0.3	37.19	0.373 0574	41.9	2.14	3.73	0	38.2
	3	21	29	45.59	7.795	15	57	2.8	37.60	0.373 1572	41.3	2.14	3.73	0	37.4
	4	21	32	52.45	7.777	15	41	55.4	38.01	0.373 2557	40.8	2.14	3.73	0	36.6
	5	21	35	58.87	+7.758	-15	26	38.3	+38.41	0.373 3529	+40.3	2.14	3.72	0	35.7
	6	21	39	4.84	7.740	15	11	11.8	38.80	0.373 4490	39.8	2.14	3.72	0	34.9
	7	21	42	10.38	7.722	14	55	36.0	39.18	0.373 5439	39.3	2.14	3.72	0	34.0
	8	21	45	15.49	7.704	14	39	51.1	39.55	0.373 6377	38.8	2.14	3.72	0	33.2
	9	21	48	20.16	7.686	14	23	57.3	39.92	0.373 7303	38.4	2.14	3.72	0	32.3
	10	21	51	24.40	+7.668	-14	7	54.9	+40.28	0.373 8218	+37.9	2.14	3.72	0	31.4
	11	21	54	28.22	7.650	13	51	44.0	40.63	0.373 9121	37.4	2.14	3.72	0	30.6
	12	21	57	31.62	7.633	13	35	24.8	40.97	0.374 0013	36.9	2.14	3.72	0	29.7
	13	22	0	34.60	7.616	13	18	57.5	41.30	0.374 0894	36.4	2.14	3.72	0	28.8
	14	22	3	37.18	7.599	13	2	22.4	41.62	0.374 1762	35.9	2.14	3.72	0	27.9
	15	22	6	39.35	+7.582	-12	45	39.6	+41.94	0.374 2618	+35.4	2.14	3.72	0	27.0
	16	22	9	41.12	+7.565	-12	28	49.3	+42.25	0.374 3462	+34.9	2.14	3.72	0	26.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m	
Feb.	16	22	9	41.12	+7.565	-12	28	49.3	+42.25	0.374 3462	+34.9	2.14	3.72	0 26.1	
	17	22	12	42.49	7.549	12	11	51.7	42.55	0.374 4292	34.3	2.14	3.72	0 25.1	
	18	22	15	43.46	7.533	11	54	47.1	42.84	0.374 5107	33.7	2.13	3.71	0 24.2	
	19	22	18	44.05	7.516	11	37	35.7	43.11	0.374 5908	33.0	2.13	3.71	0 23.3	
	20	22	21	44.24	7.500	11	20	17.8	43.38	0.374 6693	32.4	2.13	3.71	0 22.3	
	21	22	24	44.05	+7.484	-11	2	53.5	+43.64	0.374 7463	+31.7	2.13	3.71	0 21.4	
	22	22	27	43.48	7.468	10	45	23.1	43.89	0.374 8217	31.1	2.13	3.71	0 20.4	
	23	22	30	42.53	7.453	10	27	46.8	44.13	0.374 8956	30.5	2.13	3.71	0 19.5	
	24	22	33	41.21	7.437	10	10	4.7	44.37	0.374 9680	29.9	2.13	3.71	0 18.5	
	25	22	36	39.52	7.422	9	52	17.2	44.59	0.375 0389	29.2	2.13	3.71	0 17.6	
	26	22	39	37.46	+7.407	-9	34	24.4	+44.80	0.375 1083	+28.6	2.13	3.71	0 16.6	
	27	22	42	35.04	7.392	9	16	26.6	45.00	0.375 1764	28.1	2.13	3.71	0 15.6	
	28	22	45	32.27	7.377	8	58	24.0	45.20	0.375 2431	27.5	2.13	3.71	0 14.6	
	Mar.	1	22	48	29.15	7.363	8	40	16.8	45.39	0.375 3086	27.0	2.13	3.71	0 13.6
		2	22	51	25.69	7.349	8	22	5.1	45.58	0.375 3728	26.5	2.13	3.71	0 12.6
	3	22	54	21.90	+7.335	-8	3	49.2	+45.75	0.375 4359	+26.0	2.13	3.71	0 11.6	
	4	22	57	17.78	7.322	7	45	29.3	45.91	0.375 4978	25.6	2.13	3.71	0 10.6	
	5	23	0	13.35	7.309	7	27	5.6	46.06	0.375 5586	25.1	2.13	3.71	0 9.6	
	6	23	3	8.60	7.296	7	8	38.3	46.21	0.375 6182	24.6	2.12	3.70	0 8.6	
	7	23	6	3.55	7.284	6	50	7.6	46.35	0.375 6768	24.2	2.12	3.70	0 7.5	
	8	23	8	58.21	+7.272	-6	31	33.7	+46.48	0.375 7343	+23.7	2.12	3.70	0 6.5	
	9	23	11	52.59	7.260	6	12	56.7	46.60	0.375 7906	23.2	2.12	3.70	0 5.5	
	10	23	14	46.69	7.249	5	54	16.9	46.71	0.375 8458	22.8	2.12	3.70	0 4.4	
	11	23	17	40.53	7.238	5	35	34.4	46.82	0.375 8999	22.3	2.12	3.70	0 3.4	
	12	23	20	34.11	7.227	5	16	49.5	46.92	0.375 9528	21.8	2.12	3.70	0 2.3	
	13	23	23	27.44	+7.217	-4	58	2.3	+47.01	0.376 0046	+21.3	2.12	3.70	0 1.3	
	14	23	26	20.53	7.207	4	39	13.1	47.09	0.376 0550	20.7	2.12	3.70	0 0.2	
	15	23	29	13.39	7.198	4	20	22.0	47.17	0.376 1041	20.1	2.12	3.70	23 58.1	
	16	23	32	6.04	7.189	4	1	29.2	47.23	0.376 1517	19.5	2.12	3.70	23 57.0	
	17	23	34	58.47	7.180	3	42	35.0	47.29	0.376 1979	18.9	2.12	3.70	23 55.9	
	18	23	37	50.69	+7.172	-3	23	39.5	+47.34	0.376 2426	+18.3	2.12	3.70	23 54.9	
	19	23	40	42.72	7.164	3	4	42.9	47.37	0.376 2857	17.6	2.12	3.70	23 53.8	
	20	23	43	34.56	7.156	2	45	45.4	47.40	0.376 3270	16.8	2.12	3.70	23 52.7	
	21	23	46	26.21	7.149	2	26	47.3	47.43	0.376 3665	16.1	2.12	3.70	23 51.6	
	22	23	49	17.69	7.141	2	7	48.7	47.44	0.376 4042	15.3	2.12	3.70	23 50.6	
	23	23	52	8.99	+7.134	-1	48	49.9	+47.45	0.376 4399	+14.5	2.12	3.70	23 49.5	
	24	23	55	0.13	7.128	1	29	51.0	47.46	0.376 4736	13.6	2.12	3.70	23 48.3	
	25	23	57	51.11	7.121	1	10	52.4	47.44	0.376 5053	12.8	2.12	3.70	23 47.2	
	26	0	0	41.94	7.115	0	51	54.1	47.42	0.376 5351	12.0	2.12	3.70	23 46.1	
	27	0	3	32.62	7.109	0	32	56.3	47.39	0.376 5630	11.2	2.12	3.70	23 45.0	
	28	0	6	23.17	+7.104	-0	13	59.3	+47.36	0.376 5890	+10.4	2.12	3.70	23 44.0	
	29	0	9	13.59	7.098	+0	4	56.8	47.31	0.376 6131	9.7	2.12	3.70	23 42.9	
	30	0	12	3.88	7.093	0	23	51.7	47.26	0.376 6354	8.9	2.12	3.70	23 41.8	
	31	0	14	54.06	7.089	0	42	45.3	47.20	0.376 6560	8.2	2.12	3.70	23 40.7	
	Apr.	1	0	17	44.14	7.085	1	1	37.5	47.14	0.376 6748	7.4	2.12	3.70	23 39.6
	2	0	20	34.12	+7.081	+1	20	28.0	+47.07	0.376 6917	+6.7	2.12	3.70	23 38.4	
	3	0	23	24.01	+7.077	+1	39	16.6	+46.99	0.376 7068	+5.9	2.12	3.70	23 37.3	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.			
	h	m	s	s	°	'	"	"			"	"	h m		
Apr.	1	0	17	44.14	+7.085	+	1	1	37.5	+47.14	0.376 6748	+ 7.4	2.12	3.70	23 39.6
	2	0	20	34.12	7.081		1	20	28.0	47.07	0.376 6917	6.7	2.12	3.70	23 38.4
	3	0	23	24.01	7.077		1	39	16.6	46.99	0.376 7068	5.9	2.12	3.70	23 37.3
	4	0	26	13.82	7.074		1	58	3.3	46.90	0.376 7200	5.1	2.12	3.70	23 36.2
	5	0	29	3.56	7.071		2	16	47.8	46.80	0.376 7314	4.4	2.12	3.70	23 35.1
	6	0	31	53.24	+7.069	+	2	35	29.9	+46.70	0.376 7409	+ 3.6	2.12	3.70	23 34.0
	7	0	34	42.86	7.067		2	54	9.5	46.59	0.376 7486	2.8	2.12	3.70	23 32.9
	8	0	37	32.45	7.065		3	12	46.5	46.48	0.376 7545	2.1	2.12	3.70	23 31.8
	9	0	40	22.00	7.064		3	31	20.6	46.36	0.376 7585	1.2	2.12	3.70	23 30.6
	10	0	43	11.53	7.063		3	49	51.6	46.23	0.376 7604	+ 0.4	2.12	3.70	23 29.5
	11	0	46	1.04	+7.063	+	4	8	19.5	+46.09	0.376 7603	- 0.5	2.12	3.70	23 28.4
	12	0	48	50.54	7.063		4	26	44.1	45.95	0.376 7579	1.5	2.12	3.70	23 27.3
	13	0	51	40.05	7.063		4	45	5.1	45.80	0.376 7532	2.4	2.12	3.70	23 26.2
	14	0	54	29.56	7.063		5	3	22.4	45.64	0.376 7461	3.5	2.12	3.70	23 25.1
	15	0	57	19.09	7.064		5	21	35.9	45.48	0.376 7364	4.6	2.12	3.70	23 23.9
	16	1	0	8.64	+7.065	+	5	39	45.3	+45.31	0.376 7242	- 5.7	2.12	3.70	23 22.8
	17	1	2	58.23	7.067		5	57	50.5	45.13	0.376 7092	6.8	2.12	3.70	23 21.7
	18	1	5	47.85	7.068		6	15	51.3	44.94	0.376 6915	8.0	2.12	3.70	23 20.6
	19	1	8	37.51	7.070		6	33	47.6	44.75	0.376 6709	9.2	2.12	3.70	23 19.5
	20	1	11	27.22	7.072		6	51	39.1	44.55	0.376 6473	10.5	2.12	3.70	23 18.3
	21	1	14	16.98	+7.074	+	7	9	25.8	+44.34	0.376 6207	-11.7	2.12	3.70	23 17.2
	22	1	17	6.79	7.077		7	27	7.3	44.12	0.376 5911	13.0	2.12	3.70	23 16.1
	23	1	19	56.67	7.080		7	44	43.6	43.90	0.376 5584	14.3	2.12	3.70	23 15.0
	24	1	22	46.61	7.082		8	2	14.4	43.67	0.376 5226	15.6	2.12	3.70	23 13.9
	25	1	25	36.62	7.085		8	19	39.7	43.43	0.376 4836	16.9	2.12	3.70	23 12.8
	26	1	28	26.70	+7.088	+	8	36	59.1	+43.19	0.376 4415	-18.2	2.12	3.70	23 11.7
	27	1	31	16.86	7.092		8	54	12.7	42.94	0.376 3962	19.5	2.12	3.70	23 10.6
	28	1	34	7.11	7.095		9	11	20.2	42.68	0.376 3479	20.8	2.12	3.70	23 9.5
	29	1	36	57.44	7.099		9	28	21.5	42.42	0.376 2963	22.1	2.12	3.70	23 8.4
	30	1	39	47.87	7.104		9	45	16.4	42.15	0.376 2417	23.4	2.12	3.70	23 7.3
May	1	1	42	38.41	+7.108	+10	2	4.8	+41.88	0.376 1838	-24.8	2.12	3.70	23 6.2	
	2	1	45	29.05	7.112		10	18	46.6	41.60	0.376 1227	26.1	2.12	3.70	23 5.1
	3	1	48	19.80	7.117		10	35	21.5	41.31	0.376 0583	27.5	2.12	3.70	23 4.0
	4	1	51	10.67	7.122		10	51	49.6	41.02	0.375 9907	28.8	2.12	3.70	23 2.9
	5	1	54	1.67	7.128		11	8	10.5	40.72	0.375 9199	30.2	2.12	3.70	23 1.8
	6	1	56	52.79	+7.133	+11	24	24.2	+40.42	0.375 8458	-31.6	2.12	3.70	23 0.8	
	7	1	59	44.05	7.139		11	40	30.6	40.11	0.375 7684	33.0	2.12	3.70	22 59.7
	8	2	2	35.46	7.145		11	56	29.5	39.79	0.375 6875	34.4	2.12	3.70	22 58.6
	9	2	5	27.01	7.151		12	12	20.7	39.47	0.375 6031	35.9	2.12	3.70	22 57.5
	10	2	8	18.71	7.158		12	28	4.2	39.15	0.375 5151	37.4	2.13	3.71	22 56.4
	11	2	11	10.57	+7.164	+12	43	39.9	+38.82	0.375 4235	-39.0	2.13	3.71	22 55.3	
	12	2	14	2.60	7.171		12	59	7.5	38.48	0.375 3279	40.6	2.13	3.71	22 54.3
	13	2	16	54.79	7.178		13	14	26.9	38.14	0.375 2284	42.3	2.13	3.71	22 53.2
	14	2	19	47.15	7.186		13	29	38.0	37.79	0.375 1247	44.1	2.13	3.71	22 52.1
	15	2	22	39.69	7.193		13	44	40.7	37.43	0.375 0168	45.9	2.13	3.71	22 51.1
	16	2	25	32.39	+7.200	+13	59	34.8	+37.07	0.374 9045	-47.7	2.13	3.71	22 50.0	
	17	2	28	25.27	+7.207	+14	14	20.2	+36.71	0.374 7877	-49.6	2.13	3.71	22 49.0	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m
May	17	2	28	25.27	+7.207	+14	14	20.2	+36.71	0.374 7877	- 49.6	2.13	3.71	22 49.0
	18	2	31	18.32	7.214	14	28	56.7	36.34	0.374 6664	51.5	2.13	3.71	22 47.9
	19	2	34	11.54	7.221	14	43	24.2	35.96	0.374 5404	53.5	2.13	3.71	22 46.9
	20	2	37	4.94	7.229	14	57	42.6	35.57	0.374 4097	55.4	2.14	3.72	22 45.8
	21	2	39	58.51	7.236	15	11	51.6	35.18	0.374 2743	57.4	2.14	3.72	22 44.8
	22	2	42	52.26	+7.243	+15	25	51.3	+34.79	0.374 1341	- 59.4	2.14	3.72	22 43.7
	23	2	45	46.18	7.250	15	39	41.4	34.39	0.373 9890	61.5	2.14	3.72	22 42.7
	24	2	48	40.26	7.257	15	53	21.9	33.98	0.373 8391	63.5	2.14	3.72	22 41.6
	25	2	51	34.52	7.264	16	6	52.6	33.58	0.373 6841	65.6	2.14	3.72	22 40.6
	26	2	54	28.95	7.272	16	20	13.5	33.16	0.373 5242	67.7	2.14	3.72	22 39.6
	27	2	57	23.55	+7.279	+16	38	24.4	+32.74	0.373 3593	- 69.7	2.14	3.72	22 38.5
June	28	3	0	18.31	7.286	16	46	25.1	32.32	0.373 1895	71.8	2.14	3.73	22 37.5
	29	3	3	13.25	7.293	16	59	15.7	31.88	0.373 0146	73.9	2.14	3.73	22 36.5
	30	3	6	8.35	7.300	17	11	55.9	31.46	0.372 8348	76.0	2.14	3.73	22 35.5
	31	3	9	3.62	7.307	17	24	25.7	31.02	0.372 6499	78.1	2.14	3.73	22 34.4
	1	3	11	59.06	+7.314	+17	36	45.0	+30.58	0.372 4599	- 80.2	2.14	3.73	22 33.4
	2	3	14	54.67	7.321	17	48	53.7	30.14	0.372 2648	82.3	2.14	3.73	22 32.4
	3	3	17	50.44	7.327	18	0	51.7	29.69	0.372 0646	84.5	2.15	3.74	22 31.4
	4	3	20	46.38	7.334	18	12	38.8	29.24	0.371 8591	86.7	2.15	3.74	22 30.4
	5	3	23	42.49	7.341	18	24	15.0	28.78	0.371 6483	89.0	2.15	3.74	22 29.4
	6	3	26	38.77	+7.348	+18	35	40.3	+28.32	0.371 4321	- 91.2	2.15	3.74	22 28.4
	7	3	29	35.21	7.355	18	46	54.5	27.86	0.371 2105	93.5	2.15	3.74	22 27.4
	8	3	32	31.82	7.362	18	57	57.6	27.39	0.370 9832	95.9	2.15	3.75	22 26.4
	9	3	35	28.59	7.369	19	8	49.4	26.92	0.370 7503	98.3	2.15	3.75	22 25.4
	10	3	38	25.53	7.376	19	19	29.8	26.45	0.370 5115	100.8	2.15	3.75	22 24.4
	11	3	41	22.62	+7.383	+19	29	58.8	+26.97	0.370 2666	-103.3	2.15	3.75	22 23.4
	12	3	44	19.87	7.389	19	40	16.4	26.49	0.370 0156	105.9	2.15	3.75	22 22.5
	13	3	47	17.27	7.395	19	50	22.3	26.00	0.369 7583	108.5	2.16	3.76	22 21.5
	14	3	50	14.81	7.401	20	0	16.5	24.51	0.369 4946	111.2	2.16	3.76	22 20.5
	15	3	53	12.49	7.406	20	9	59.0	24.02	0.369 2244	114.0	2.16	3.76	22 19.5
	16	3	56	10.29	+7.411	+20	19	29.6	+23.53	0.368 9476	-116.7	2.16	3.76	22 18.5
	17	3	59	8.23	7.416	20	28	48.3	23.03	0.368 6641	119.5	2.16	3.77	22 17.5
18	4	2	6.28	7.421	20	37	55.0	22.53	0.368 3738	122.4	2.16	3.77	22 16.6	
19	4	5	4.44	7.426	20	46	49.7	22.03	0.368 0766	125.3	2.16	3.77	22 15.6	
20	4	8	2.71	7.430	20	55	32.2	21.52	0.367 7724	128.2	2.16	3.77	22 14.6	
July	21	4	11	1.06	+7.433	+21	4	2.6	+21.01	0.367 4613	-131.1	2.17	3.78	22 13.6
	22	4	13	59.50	7.437	21	12	20.7	20.50	0.367 1431	134.0	2.17	3.78	22 12.7
	23	4	16	58.03	7.440	21	20	26.6	19.99	0.366 8179	137.0	2.17	3.78	22 11.7
	24	4	19	56.62	7.443	21	28	20.1	19.47	0.366 4856	140.0	2.17	3.78	22 10.8
	25	4	22	55.28	7.445	21	36	1.2	18.95	0.366 1461	143.0	2.18	3.79	22 9.8
	26	4	25	54.00	+7.448	+21	43	29.9	+18.44	0.365 7994	-146.0	2.18	3.79	22 8.8
	27	4	28	52.77	7.450	21	50	46.1	17.92	0.365 4455	149.0	2.18	3.79	22 7.9
	28	4	31	51.58	7.452	21	57	49.9	17.40	0.365 0843	152.0	2.18	3.80	22 6.9
	29	4	34	50.44	7.453	22	4	41.1	16.87	0.364 7158	155.0	2.18	3.80	22 5.9
	30	4	37	49.32	7.454	22	11	19.7	16.35	0.364 3401	158.1	2.18	3.80	22 5.0
	1	4	40	48.23	+7.455	+22	17	45.8	+15.82	0.363 9571	-161.1	2.19	3.81	22 4.0
2	4	43	47.15	+7.455	+22	23	59.2	+15.29	0.363 5668	-164.2	2.19	3.81	22 3.1	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"					h	m	
July	1	4	40	48.23	+7.455	+22	17	45.8	+15.82	0.363 9571	-161.1	2.19	3.81	22	4.0
	2	4	43	47.15	7.455	22	23	59.2	15.29	0.363 5668	164.2	2.19	3.81	22	3.1
	3	4	46	46.08	7.456	22	29	59.9	14.77	0.363 1690	167.3	2.19	3.81	22	2.1
	4	4	49	45.02	7.456	22	35	48.0	14.24	0.362 7636	170.5	2.19	3.82	22	1.1
	5	4	52	43.96	7.456	22	41	23.4	13.71	0.362 3506	173.7	2.19	3.82	22	0.2
	6	4	55	42.90	+7.455	+22	46	46.1	+13.18	0.361 9297	-177.0	2.19	3.82	21	59.2
	7	4	58	41.81	7.454	22	51	56.0	12.65	0.361 5010	180.3	2.20	3.83	21	58.3
	8	5	1	40.71	7.453	22	56	53.2	12.12	0.361 0642	183.7	2.20	3.83	21	57.3
	9	5	4	39.58	7.452	23	1	37.7	11.59	0.360 6193	187.1	2.20	3.84	21	56.4
	10	5	7	38.41	7.450	23	6	9.5	11.06	0.360 1661	190.6	2.20	3.84	21	55.4
	11	5	10	37.20	+7.448	+23	10	28.5	+10.53	0.359 7043	-194.2	2.20	3.84	21	54.4
	12	5	13	35.93	7.446	23	14	34.7	9.99	0.359 2339	197.8	2.21	3.85	21	53.4
	13	5	16	34.59	7.443	23	18	28.1	9.46	0.358 7547	201.5	2.21	3.85	21	52.5
	14	5	19	33.17	7.439	23	22	8.8	8.93	0.358 2666	205.3	2.22	3.86	21	51.5
	15	5	22	31.65	7.435	23	25	36.7	8.40	0.357 7694	209.1	2.22	3.86	21	50.6
	16	5	25	30.04	+7.431	+23	28	51.9	+7.87	0.357 2631	-212.9	2.22	3.87	21	49.6
	17	5	28	28.31	7.426	23	31	54.4	7.34	0.356 7476	216.7	2.22	3.87	21	48.6
	18	5	31	26.46	7.420	23	34	44.1	6.81	0.356 2228	220.6	2.22	3.87	21	47.7
	19	5	34	24.47	7.413	23	37	21.2	6.28	0.355 6886	224.5	2.23	3.88	21	46.7
	20	5	37	22.33	7.407	23	39	45.7	5.76	0.355 1450	228.5	2.23	3.88	21	45.7
	21	5	40	20.03	+7.401	+23	41	57.5	+5.23	0.354 5920	-232.4	2.23	3.89	21	44.7
	22	5	43	17.57	7.394	23	43	56.7	4.71	0.354 0294	236.4	2.23	3.89	21	43.7
	23	5	46	14.92	7.386	23	45	43.4	4.19	0.353 4572	240.4	2.24	3.90	21	42.7
	24	5	49	12.07	7.377	23	47	17.6	3.67	0.352 8755	244.4	2.24	3.90	21	41.7
	25	5	52	9.03	7.369	23	48	39.3	3.15	0.352 2841	248.4	2.24	3.91	21	40.7
	26	5	55	5.78	+7.360	+23	49	48.6	+2.63	0.351 6830	-252.5	2.25	3.92	21	39.7
	27	5	58	2.30	7.351	23	50	45.5	2.12	0.351 0721	256.0	2.25	3.92	21	38.7
	28	6	0	58.60	7.341	23	51	30.1	1.60	0.350 4515	260.6	2.26	3.93	21	37.7
	29	6	3	54.66	7.331	23	52	2.5	1.09	0.349 8211	264.7	2.26	3.93	21	36.7
	30	6	6	50.48	7.321	23	52	22.6	0.58	0.349 1808	268.9	2.26	3.94	21	35.7
Aug.	31	6	9	46.05	+7.310	+23	52	30.5	+0.08	0.348 5305	-273.0	2.26	3.94	21	34.7
	1	6	12	41.35	7.299	23	52	26.3	-0.43	0.347 8702	277.2	2.27	3.95	21	33.7
	2	6	15	36.39	7.288	23	52	10.0	0.93	0.347 1998	281.5	2.27	3.96	21	32.6
	3	6	18	31.15	7.276	23	51	41.8	1.43	0.346 5192	285.7	2.27	3.96	21	31.6
	4	6	21	25.64	7.264	23	51	1.5	1.93	0.345 8283	290.1	2.28	3.97	21	30.6
	5	6	24	19.83	+7.252	+23	50	9.4	-2.42	0.345 1268	-294.5	2.28	3.97	21	29.5
	6	6	27	13.74	7.240	23	49	5.5	2.91	0.344 4147	298.9	2.28	3.98	21	28.5
	7	6	30	7.34	7.227	23	47	49.8	3.40	0.343 6918	303.5	2.29	3.99	21	27.4
	8	6	33	0.63	7.214	23	46	22.5	3.88	0.342 9578	308.2	2.29	3.99	21	26.4
	9	6	35	53.60	7.200	23	44	43.6	4.36	0.342 2126	312.8	2.30	4.00	21	25.3
	10	6	38	46.23	+7.186	+23	42	53.2	-4.84	0.341 4561	-317.6	2.30	4.01	21	24.2
	11	6	41	38.52	7.172	23	40	51.4	5.31	0.340 6881	322.4	2.31	4.02	21	23.1
	12	6	44	30.46	7.157	23	38	38.3	5.78	0.339 9085	327.3	2.31	4.02	21	22.1
	13	6	47	22.04	7.141	23	36	13.9	6.25	0.339 1170	332.2	2.31	4.03	21	21.0
	14	6	50	13.24	7.126	23	33	38.4	6.71	0.338 3137	337.2	2.32	4.04	21	19.9
	15	6	53	4.07	+7.110	+23	30	51.8	-7.17	0.337 4984	-342.2	2.32	4.05	21	18.8
	16	6	55	54.50	+7.093	+23	27	54.3	-7.62	0.336 6710	-347.3	2.32	4.05	21	17.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit. Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"					h	m	
Aug.	16	6	55	54.50	+7.093	+23	27	54.3	-7.62	0.336 6710	-347.3	2.32	4.05	21 17.7	
	17	6	58	44.53	7.076	23	24	45.9	8.07	0.335 8315	352.3	2.33	4.06	21 16.6	
	18	7	1	34.15	7.059	23	21	26.8	8.52	0.334 9798	357.4	2.34	4.07	21 15.4	
	19	7	4	23.36	7.042	23	17	57.0	8.96	0.334 1159	362.5	2.34	4.08	21 14.3	
	20	7	7	12.14	7.024	23	14	16.6	9.40	0.333 2396	367.7	2.34	4.08	21 13.2	
	21	7	10	0.48	+7.005	+23	10	25.9	-9.83	0.332 3509	-372.9	2.35	4.09	21 12.0	
	22	7	12	48.38	6.987	23	6	24.9	10.26	0.331 4497	378.1	2.35	4.10	21 10.9	
	23	7	15	35.84	6.968	23	2	13.6	10.68	0.330 5361	383.3	2.36	4.11	21 9.7	
	24	7	18	22.83	6.949	22	57	52.3	11.10	0.329 6099	388.5	2.36	4.12	21 8.6	
	25	7	21	9.37	6.929	22	53	21.0	11.51	0.328 6712	393.8	2.37	4.13	21 7.4	
	26	7	23	55.44	+6.910	+22	48	39.8	-11.92	0.327 7198	-399.1	2.38	4.14	21 6.2	
	27	7	26	41.04	6.890	22	43	48.8	12.33	0.326 7557	404.3	2.38	4.15	21 5.0	
	28	7	29	26.17	6.870	22	38	48.1	12.73	0.325 7789	409.7	2.39	4.16	21 3.8	
	29	7	32	10.81	6.850	22	33	37.9	13.12	0.324 7892	415.1	2.39	4.17	21 2.6	
	30	7	34	54.98	6.830	22	28	18.2	13.51	0.323 7866	420.5	2.40	4.18	21 1.4	
	Sept.	31	7	37	38.66	+6.810	+22	22	49.2	-13.90	0.322 7709	-426.0	2.40	4.18	21 0.2
		1	7	40	21.85	6.789	22	17	11.0	14.28	0.321 7419	431.5	2.41	4.19	20 59.0
		2	7	43	4.55	6.769	22	11	23.6	14.66	0.320 6996	437.1	2.41	4.20	20 57.7
		3	7	45	46.76	6.749	22	5	27.2	15.03	0.319 6438	442.8	2.42	4.21	20 56.4
		4	7	48	28.48	6.728	21	59	22.0	15.40	0.318 5742	448.5	2.43	4.23	20 55.2
		5	7	51	9.69	+6.707	+21	53	8.0	-15.76	0.317 4907	-454.4	2.43	4.24	20 54.0
		6	7	53	50.40	6.686	21	46	45.4	16.12	0.316 3930	460.3	2.44	4.25	20 52.7
		7	7	56	30.60	6.664	21	40	14.3	16.47	0.315 2811	466.3	2.45	4.26	20 51.4
		8	7	59	10.29	6.643	21	33	34.8	16.82	0.314 1547	472.4	2.45	4.27	20 50.1
		9	8	1	49.45	6.621	21	26	47.0	17.16	0.313 0137	478.5	2.46	4.28	20 48.8
		10	8	4	28.08	+6.599	+21	19	51.2	-17.49	0.311 8579	-484.7	2.46	4.29	20 47.5
		11	8	7	6.18	6.576	21	12	47.4	17.82	0.310 6871	491.0	2.47	4.30	20 46.2
		12	8	9	43.74	6.554	21	5	35.8	18.14	0.309 5013	497.2	2.47	4.31	20 44.9
		13	8	12	20.76	6.531	20	58	16.5	18.46	0.308 3004	503.6	2.49	4.33	20 43.6
		14	8	14	57.23	6.508	20	50	49.7	18.77	0.307 0842	510.0	2.49	4.34	20 42.2
15		8	17	33.14	+6.485	+20	43	15.5	-19.08	0.305 8526	-516.4	2.50	4.35	20 40.9	
16		8	20	8.50	6.461	20	35	34.0	19.38	0.304 6056	522.8	2.50	4.36	20 39.5	
17		8	22	43.30	6.438	20	27	45.4	19.67	0.303 3430	529.3	2.51	4.38	20 38.1	
18		8	25	17.53	6.415	20	19	49.8	19.96	0.302 0648	535.9	2.52	4.39	20 36.8	
19		8	27	51.21	6.391	20	11	47.4	20.24	0.300 7708	542.5	2.53	4.40	20 35.4	
20		8	30	24.29	+6.367	+20	3	38.3	-20.52	0.299 4610	-549.0	2.54	4.42	20 34.0	
21		8	32	56.80	6.343	19	55	22.6	20.79	0.298 1354	555.6	2.54	4.43	20 32.6	
22		8	35	28.74	6.319	19	47	0.6	21.05	0.296 7940	562.2	2.55	4.44	20 31.2	
23		8	38	0.10	6.294	19	38	32.3	21.31	0.295 4367	568.9	2.56	4.46	20 29.7	
24		8	40	30.87	6.270	19	29	57.8	21.57	0.294 0634	575.6	2.57	4.47	20 28.3	
25		8	43	1.07	+6.246	+19	21	17.2	-21.81	0.292 6740	-582.3	2.58	4.49	20 26.9	
26		8	45	30.68	6.222	19	12	30.8	22.05	0.291 2685	589.0	2.58	4.50	20 25.4	
27		8	47	59.72	6.198	19	3	38.6	22.29	0.289 8467	595.8	2.59	4.51	20 23.9	
28		8	50	28.18	6.174	18	54	40.8	22.53	0.288 4085	602.7	2.60	4.53	20 22.5	
29		8	52	56.07	6.150	18	45	37.4	22.76	0.286 9537	609.6	2.61	4.54	20 21.0	
30	8	55	23.37	+6.126	+18	36	28.6	-22.98	0.285 4823	-616.6	2.62	4.56	20 19.5		
Oct.	1	8	57	50.10	+6.102	+18	27	14.6	-23.19	0.283 9940	-623.6	2.63	4.58	20 18.0	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit. Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Oct. 1	8	57	50.10	+6.102	+18	27	14.6	-23.19	0.283 9940	-623.6	2.63	4.58	20 18.0
2	9	0	16.25	6.078	18	17	55.4	23.40	0.282 4887	630.8	2.63	4.59	20 16.4
3	9	2	41.82	6.054	18	8	31.2	23.61	0.280 9660	638.1	2.65	4.61	20 14.9
4	9	5	6.82	6.030	17	59	2.2	23.81	0.279 4257	645.5	2.65	4.62	20 13.4
5	9	7	31.24	6.006	17	49	28.5	24.00	0.277 8677	652.9	2.66	4.64	20 11.9
6	9	9	55.08	+5.981	+17	39	50.2	-24.19	0.276 2917	-660.4	2.67	4.66	20 10.3
7	9	12	18.33	5.957	17	30	7.6	24.37	0.274 6975	668.1	2.69	4.68	20 8.7
8	9	14	40.99	5.932	17	20	20.7	24.54	0.273 0850	675.7	2.69	4.69	20 7.2
9	9	17	3.06	5.907	17	10	29.7	24.71	0.271 4540	683.5	2.70	4.71	20 5.6
10	9	19	24.54	5.882	17	0	34.8	24.87	0.269 8043	691.3	2.72	4.73	20 4.0
11	9	21	45.42	+5.857	+16	50	36.0	-25.02	0.268 1358	-699.1	2.73	4.75	20 2.4
12	9	24	5.69	5.832	16	40	33.7	25.17	0.266 4484	707.0	2.73	4.76	20 0.8
13	9	26	25.37	5.807	16	30	27.8	25.32	0.264 7420	715.0	2.74	4.78	19 59.2
14	9	28	44.44	5.782	16	20	18.6	25.46	0.263 0164	723.0	2.76	4.80	19 57.5
15	9	31	2.90	5.756	16	10	6.2	25.58	0.261 2715	731.1	2.77	4.82	19 55.9
16	9	33	20.74	+5.731	+15	59	50.8	-25.70	0.259 5072	-739.2	2.78	4.84	19 54.2
17	9	35	37.97	5.705	15	49	32.6	25.82	0.257 7233	747.4	2.79	4.86	19 52.6
18	9	37	54.57	5.679	15	39	11.6	25.93	0.255 9199	755.5	2.80	4.88	19 50.9
19	9	40	10.55	5.653	15	28	48.1	26.03	0.254 0969	763.7	2.81	4.90	19 49.2
20	9	42	25.91	5.627	15	18	22.2	26.13	0.252 2541	771.9	2.82	4.92	19 47.5
21	9	44	40.65	+5.601	+15	7	54.0	-26.22	0.250 3916	-780.2	2.84	4.94	19 45.8
22	9	46	54.76	5.575	14	57	23.6	26.31	0.248 5093	788.5	2.85	4.96	19 44.1
23	9	49	8.26	5.549	14	46	51.2	26.39	0.246 6070	796.8	2.86	4.99	19 42.4
24	9	51	21.13	5.523	14	36	16.8	26.47	0.244 6848	805.1	2.88	5.01	19 40.7
25	9	53	33.37	5.497	14	25	40.7	26.54	0.242 7426	813.5	2.89	5.03	19 38.9
26	9	55	44.99	+5.471	+14	15	2.9	-26.61	0.240 7801	-822.0	2.90	5.05	19 37.2
27	9	57	55.99	5.445	14	4	23.6	26.67	0.238 7972	830.5	2.92	5.08	19 35.4
28	10	0	6.36	5.419	13	53	43.0	26.72	0.236 7937	839.1	2.93	5.10	19 33.6
29	10	2	16.11	5.393	13	43	1.1	26.77	0.234 7695	847.8	2.94	5.12	19 31.8
30	10	4	25.24	5.367	13	32	18.2	26.81	0.232 7243	856.6	2.96	5.15	19 30.0
31	10	6	33.74	+5.341	+13	21	34.2	-26.85	0.230 6578	-865.5	2.97	5.17	19 28.2
Nov. 1	10	8	41.62	5.315	13	10	49.4	26.88	0.228 5699	874.5	2.98	5.20	19 26.4
2	10	10	48.87	5.289	13	0	4.0	26.90	0.226 4602	883.6	3.00	5.22	19 24.6
3	10	12	55.49	5.263	12	49	18.0	26.92	0.224 3286	892.8	3.01	5.25	19 22.7
4	10	15	1.47	5.236	12	38	31.7	26.94	0.222 1749	902.0	3.03	5.28	19 20.9
5	10	17	6.80	+5.209	+12	27	45.1	-26.94	0.219 9988	-911.4	3.04	5.30	19 19.0
6	10	19	11.49	5.182	12	16	58.5	26.94	0.217 8002	920.8	3.06	5.33	19 17.2
7	10	21	15.53	5.154	12	6	12.0	26.93	0.215 5789	930.3	3.08	5.36	19 15.3
8	10	23	18.90	5.127	11	55	25.9	26.91	0.213 3347	939.9	3.09	5.38	19 13.4
9	10	25	21.61	5.099	11	44	40.2	26.89	0.211 0674	949.6	3.11	5.41	19 11.5
10	10	27	23.65	+5.071	+11	33	55.2	-26.86	0.208 7768	-959.3	3.12	5.44	19 9.6
11	10	29	25.01	5.043	11	23	10.9	26.83	0.206 4629	969.0	3.14	5.47	19 7.6
12	10	31	25.69	5.014	11	12	27.5	26.78	0.204 1255	978.8	3.16	5.50	19 5.7
13	10	33	25.66	4.984	11	1	45.3	26.73	0.201 7645	988.7	3.17	5.53	19 3.7
14	10	35	24.94	4.955	10	51	4.3	26.68	0.199 3798	998.5	3.19	5.56	19 1.8
15	10	37	23.51	+4.925	+10	40	24.8	-26.62	0.196 9715	-1008.4	3.21	5.59	18 59.8
16	10	39	21.36	+4.895	+10	29	46.9	-26.55	0.194 5394	-1018.3	3.23	5.62	18 57.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Nov. 16	10 39 21.36	+4.895	+10 29 46.9	-26.55	0.194 5394	-1018.3	3.23	5.62	18 57.8
17	10 41 18.49	4.865	10 19 10.7	26.47	0.192 0835	1028.2	3.24	5.65	18 55.8
18	10 43 14.90	4.835	10 8 36.4	26.39	0.189 6038	1038.2	3.27	5.69	18 53.8
19	10 45 10.59	4.805	9 58 4.1	26.30	0.187 1002	1048.2	3.28	5.72	18 51.8
20	10 47 5.53	4.774	9 47 33.9	26.21	0.184 5726	1058.1	3.30	5.75	18 49.8
21	10 48 59.73	+4.743	+ 9 37 6.1	-26.11	0.182 0211	-1068.1	3.32	5.79	18 47.7
22	10 50 53.18	4.712	9 26 40.7	26.00	0.179 4455	1078.2	3.34	5.82	18 45.7
23	10 52 45.87	4.680	9 16 18.0	25.89	0.176 8457	1088.3	3.36	5.86	18 43.6
24	10 54 37.81	4.648	9 5 57.9	25.78	0.174 2215	1098.5	3.38	5.89	18 41.5
25	10 56 28.98	4.616	8 55 40.7	25.66	0.171 5729	1108.7	3.40	5.93	18 39.4
26	10 58 19.39	+4.584	+ 8 45 26.5	-25.52	0.168 8996	-1119.1	3.42	5.96	18 37.3
27	11 0 9.02	4.552	8 35 15.6	25.39	0.166 2013	1129.5	3.44	6.00	18 35.2
28	11 1 57.86	4.519	8 25 7.9	25.25	0.163 4781	1139.9	3.47	6.04	18 33.0
29	11 3 45.91	4.486	8 15 3.7	25.10	0.160 7296	1150.5	3.49	6.08	18 30.9
30	11 5 33.16	4.452	8 5 3.1	24.95	0.157 9557	1161.1	3.51	6.12	18 28.7
Dec. 1	11 7 19.59	+4.418	+ 7 55 6.3	-24.79	0.155 1561	-1171.9	3.54	6.16	18 26.5
2	11 9 5.20	4.383	7 45 13.4	24.62	0.152 3307	1182.6	3.56	6.20	18 24.4
3	11 10 49.96	4.348	7 35 24.8	24.44	0.149 4793	1193.5	3.58	6.24	18 22.2
4	11 12 33.88	4.312	7 25 40.5	24.25	0.146 6016	1204.5	3.60	6.28	18 19.9
5	11 14 16.92	4.275	7 16 0.8	24.06	0.143 6975	1215.6	3.63	6.32	18 17.7
6	11 15 59.09	+4.238	+ 7 6 25.8	-23.86	0.140 7669	-1226.6	3.65	6.36	18 15.5
7	11 17 40.35	4.200	6 56 55.8	23.64	0.137 8097	1237.7	3.68	6.41	18 13.2
8	11 19 20.70	4.162	6 47 30.9	23.42	0.134 8259	1248.8	3.70	6.45	18 10.9
9	11 21 0.11	4.123	6 38 11.3	23.20	0.131 8153	1260.0	3.73	6.50	18 8.6
10	11 22 38.58	4.083	6 28 57.3	22.97	0.128 7781	1271.1	3.75	6.54	18 6.3
11	11 24 16.07	+4.042	+ 6 19 48.9	-22.73	0.125 7142	-1282.2	3.78	6.59	18 4.0
12	11 25 52.58	4.000	6 10 46.4	22.48	0.122 6236	1293.3	3.81	6.63	18 1.7
13	11 27 28.08	3.958	6 1 49.9	22.22	0.119 5064	1304.4	3.83	6.68	17 59.3
14	11 29 2.55	3.915	5 52 59.7	21.96	0.116 3626	1315.4	3.86	6.73	17 56.9
15	11 30 35.98	3.871	5 44 16.0	21.68	0.113 1924	1326.4	3.89	6.78	17 54.5
16	11 32 8.34	+3.826	+ 5 35 38.9	-21.40	0.109 9959	-1337.3	3.92	6.83	17 52.1
17	11 33 39.63	3.781	5 27 8.6	21.12	0.106 7732	1348.2	3.95	6.88	17 49.7
18	11 35 9.81	3.734	5 18 45.3	20.82	0.103 5244	1359.1	3.98	6.93	17 47.2
19	11 36 38.88	3.688	5 10 29.1	20.52	0.100 2497	1369.8	4.01	6.99	17 44.8
20	11 38 6.81	3.640	5 2 20.2	20.21	0.096 9493	1380.5	4.04	7.04	17 42.3
21	11 39 33.60	+3.592	+ 4 54 18.9	-19.90	0.093 6232	-1391.2	4.07	7.09	17 39.8
22	11 40 59.21	3.542	4 46 25.1	19.58	0.090 2715	1401.9	4.10	7.15	17 37.2
23	11 42 23.63	3.492	4 38 39.2	19.25	0.086 8943	1412.5	4.13	7.20	17 34.7
24	11 43 46.84	3.442	4 31 1.2	18.91	0.083 4917	1423.0	4.17	7.26	17 32.1
25	11 45 8.82	3.390	4 23 31.4	18.57	0.080 0638	1433.6	4.20	7.32	17 29.5
26	11 46 29.55	+3.337	+ 4 16 9.9	-18.22	0.076 6105	-1444.2	4.24	7.38	17 26.9
27	11 47 48.99	3.283	4 8 57.1	17.85	0.073 1319	1454.7	4.27	7.44	17 24.3
28	11 49 7.14	3.228	4 1 53.0	17.48	0.069 6282	1465.1	4.30	7.50	17 21.7
29	11 50 23.95	3.172	3 54 57.9	17.10	0.066 0993	1475.6	4.34	7.56	17 19.0
30	11 51 39.41	3.115	3 48 12.1	16.71	0.062 5455	1485.9	4.37	7.62	17 16.3
31	11 52 53.47	+3.056	+ 3 41 35.7	-16.31	0.058 9668	-1496.3	4.41	7.68	17 13.6
32	11 54 6.11	...	+ 3 35 9.1	...	0.055 3635	...	4.45	7.75	17 10.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
Jan.	1	302 56 43.4	37 8.1	+28.5	-1 46 44.3	-19.8	0.145 9131	-2120
	3	304 11 4.0	37 12.4	26.5	1 47 22.4	18.3	0.145 4963	2047
	5	305 25 33.1	37 16.6	24.4	1 47 57.5	16.8	0.145 0942	1973
	7	306 40 10.3	37 20.6	22.3	1 48 29.7	15.3	0.144 7071	1897
	9	307 54 55.3	37 24.5	20.1	1 48 58.9	13.8	0.144 3353	1821
	11	309 9 48.0	37 28.2	+17.9	-1 49 25.0	-12.3	0.143 9789	-1743
	13	310 24 47.9	37 31.7	15.7	1 49 48.0	10.8	0.143 6383	1663
	15	311 39 54.7	37 35.1	13.5	1 50 8.0	9.2	0.143 3136	1583
	17	312 55 8.1	37 38.3	11.2	1 50 24.8	7.6	0.143 0051	1502
	19	314 10 27.8	37 41.4	8.9	1 50 38.5	6.0	0.142 7129	1419
	21	315 25 53.4	37 44.3	+ 6.5	-1 50 48.9	- 4.4	0.142 4374	-1336
	23	316 41 24.7	37 47.0	4.2	1 50 56.2	2.9	0.142 1786	1252
	25	317 57 1.1	37 49.5	+ 1.8	1 51 0.3	- 1.3	0.141 9367	1167
	27	319 12 42.5	37 51.8	- 0.5	1 51 1.2	+ 0.4	0.141 7119	1081
	29	320 28 28.3	37 54.0	2.9	1 50 58.8	2.0	0.141 5043	995
	31	321 44 18.3	37 56.0	- 5.3	-1 50 53.2	+ 3.6	0.141 3141	- 907
Feb.	2	323 0 12.1	37 57.8	7.6	1 50 44.4	5.2	0.141 1414	820
	4	324 16 9.3	37 59.4	10.0	1 50 32.3	6.9	0.140 9863	731
	6	325 32 9.6	38 0.8	12.3	1 50 16.9	8.5	0.140 8490	642
	8	326 48 12.5	38 2.1	14.6	1 49 58.4	10.1	0.140 7296	553
	10	328 4 17.8	38 3.1	-16.9	-1 49 36.6	+11.7	0.140 6280	- 463
	12	329 20 24.9	38 4.0	19.1	1 49 11.6	13.3	0.140 5445	372
	14	330 36 33.6	38 4.7	21.3	1 48 43.3	14.9	0.140 4790	282
	16	331 52 43.5	38 5.2	23.5	1 48 11.8	16.5	0.140 4316	192
	18	333 8 54.1	38 5.4	25.6	1 47 37.1	18.1	0.140 4023	101
	20	334 25 5.1	38 5.5	-27.7	-1 46 59.3	+19.7	0.140 3912	- 19
	22	335 41 16.0	38 5.4	29.7	1 46 18.3	21.3	0.140 3982	+ 81
	24	336 57 26.6	38 5.1	31.7	1 45 34.2	22.8	0.140 4235	172
	26	338 13 36.4	38 4.6	33.6	1 44 46.9	24.4	0.140 4668	262
	28	339 29 45.0	38 4.0	35.4	1 43 56.6	25.9	0.140 5282	352
Mar.	2	340 45 52.1	38 3.1	-37.1	-1 43 3.3	+27.4	0.140 6077	+ 443
	4	342 1 57.3	38 2.0	38.8	1 42 6.9	28.9	0.140 7052	532
	6	343 18 0.1	38 0.8	40.4	1 41 7.6	30.4	0.140 8206	622
	8	344 34 0.3	37 59.3	42.0	1 40 5.4	31.8	0.140 9540	711
	10	345 49 57.3	37 57.7	43.4	1 39 0.3	33.3	0.141 1051	800
	12	347 5 51.0	37 55.9	-44.8	-1 37 52.3	+34.7	0.141 2738	+ 887
	14	348 21 40.8	37 53.9	46.0	1 36 41.5	36.1	0.141 4600	975
	16	349 37 26.5	37 51.8	47.2	1 35 28.0	37.4	0.141 6637	1062
	18	350 53 7.7	37 49.4	48.3	1 34 11.8	38.8	0.141 8847	1148
	20	352 8 43.9	37 46.8	49.3	1 32 52.9	40.1	0.142 1228	1233
	22	353 24 14.9	37 44.1	-50.2	-1 31 31.4	+41.4	0.142 3779	+1317
	24	354 39 40.3	37 41.2	51.0	1 30 7.4	42.6	0.142 6497	1401
	26	355 54 59.8	37 38.2	51.7	1 28 40.9	43.9	0.142 9382	1484
	28	357 10 13.1	37 35.0	52.3	1 27 11.9	45.1	0.143 2431	1565
	30	358 25 19.7	37 31.6	52.8	1 25 40.6	46.3	0.143 5642	1646
Apr.	1	359 40 19.4	37 28.0	-53.2	-1 24 6.9	+47.4	0.143 9014	+1725
	3	0 55 11.8	37 24.3	-53.5	-1 22 31.1	+48.4	0.144 2543	+1804

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	" "	" "	° ' "	" "		
Apr.	1	359 40 19.4	37 28.0	-53.2	-1 24 6.9	+47.4	0.143 9014	+1725
	3	0 55 11.8	37 24.3	53.5	1 22 31.1	48.4	0.144 2543	1804
	5	2 9 56.7	37 20.5	53.7	1 20 53.1	49.5	0.144 6228	1881
	7	3 24 33.8	37 16.5	53.8	1 19 12.9	50.6	0.145 0066	1957
	9	4 39 2.7	37 12.4	53.8	1 17 30.7	51.6	0.145 4064	2031
	11	5 53 23.2	37 8.1	-53.6	-1 15 46.6	+52.6	0.145 8191	+2106
	13	7 7 34.9	37 3.6	53.4	1 14 0.4	53.6	0.146 2473	2177
	15	8 21 37.6	36 59.0	53.1	1 12 12.4	54.5	0.146 6897	2247
	17	9 35 31.0	36 54.3	52.7	1 10 22.6	55.3	0.147 1462	2317
	19	10 49 14.9	36 49.5	52.2	1 8 31.2	56.1	0.147 6184	2386
	21	12 2 49.0	36 44.5	-51.6	-1 6 38.1	+57.0	0.148 1000	+2451
	23	13 16 13.0	36 39.5	51.0	1 4 43.4	57.7	0.148 5967	2516
	25	14 29 26.8	36 34.3	50.2	1 2 47.2	58.5	0.149 1062	2579
	27	15 42 30.1	36 29.0	49.3	1 0 49.6	59.1	0.149 6283	2641
	29	16 55 22.7	36 23.6	48.3	0 58 50.7	59.8	0.150 1625	2701
May	1	18 8 4.3	36 18.0	-47.3	-0 56 50.5	+60.4	0.150 7086	+2760
	3	19 20 34.7	36 12.4	46.2	0 54 49.1	61.0	0.151 2663	2817
	5	20 32 53.8	36 6.7	45.0	0 52 46.5	61.6	0.151 8353	2872
	7	21 45 1.3	36 0.8	43.7	0 50 42.8	62.1	0.152 4151	2926
	9	22 56 57.0	35 54.9	42.4	0 48 38.1	62.6	0.153 0056	2979
	11	24 8 41.0	35 49.0	-40.9	-0 46 32.5	+63.0	0.153 6064	+3029
	13	25 20 12.9	35 42.9	39.4	0 44 26.1	63.4	0.154 2170	3077
	15	26 31 32.5	35 36.7	37.9	0 42 18.8	63.8	0.154 8372	3124
	17	27 42 39.8	35 30.6	36.3	0 40 10.8	64.2	0.155 4667	3170
	19	28 53 34.7	35 24.3	34.6	0 38 2.2	64.5	0.156 1051	3214
	21	30 4 16.8	35 17.9	-32.9	-0 35 53.0	+64.7	0.156 7520	+3256
	23	31 14 46.3	35 11.5	31.1	0 33 43.3	65.0	0.157 4072	3296
	25	32 25 2.9	35 5.1	29.3	0 31 33.1	65.2	0.158 0703	3335
	27	33 35 6.5	34 58.5	27.4	0 29 22.5	65.4	0.158 7409	3372
	29	34 44 57.0	34 52.0	25.5	0 27 11.6	65.5	0.159 4188	3407
	31	35 54 34.4	34 45.4	-23.6	-0 25 0.4	+65.6	0.160 1035	+3440
June	2	37 3 58.4	34 38.7	21.6	0 22 49.1	65.7	0.160 7947	3473
	4	38 13 9.2	34 32.1	19.6	0 20 37.6	65.8	0.161 4922	3502
	6	39 22 6.6	34 25.3	17.6	0 18 26.1	65.8	0.162 1955	3531
	8	40 30 50.5	34 18.6	15.6	0 16 14.5	65.8	0.162 9044	3558
	10	41 39 21.0	34 11.8	-13.5	-0 14 2.9	+65.8	0.163 6184	+3583
	12	42 47 37.8	34 5.0	11.4	0 11 51.5	65.7	0.164 3373	3606
	14	43 55 41.0	33 58.2	9.3	0 9 40.2	65.6	0.165 0607	3628
	16	45 3 30.7	33 51.4	7.2	0 7 29.1	65.5	0.165 7883	3648
	18	46 11 6.6	33 44.5	5.1	0 5 18.3	65.3	0.166 5198	3667
	20	47 18 28.9	33 37.7	-3.0	-0 3 7.8	+65.2	0.167 2549	+3684
	22	48 25 37.5	33 30.9	-0.9	-0 0 57.7	64.9	0.167 9932	3699
	24	49 32 32.4	33 24.0	+1.1	+0 1 11.9	64.7	0.168 7345	3713
	26	50 39 13.6	33 17.2	3.2	0 3 21.2	64.5	0.169 4783	3725
	28	51 45 41.1	33 10.3	5.3	0 5 29.9	64.2	0.170 2245	3736
	30	52 51 54.8	33 3.5	+7.4	+0 7 38.0	+63.9	0.170 9728	+3746
July	2	53 57 55.0	32 56.6	+9.4	+0 9 45.6	+63.6	0.171 7227	+3753

FOR GREENWICH MEAN NOON.

Data.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
July	2	53 57 55.0	32 56.6	+ 9.4	+0 9 45.6	+63.6	0.171 7227	+3753
	4	55 8 41.4	32 49.8	11.4	0 11 52.4	63.2	0.172 1740	3760
	6	56 9 14.3	32 43.0	13.4	0 13 58.6	62.9	0.173 2265	3765
	8	57 14 33.5	32 36.2	15.4	0 16 4.0	62.5	0.173 9797	3768
	10	58 19 39.2	32 29.5	17.3	0 18 8.7	62.1	0.174 7386	3770
	12	59 24 31.4	32 22.7	+19.2	+0 20 12.5	+61.7	0.175 4877	+3771
	14	60 29 10.2	32 16.0	21.1	0 22 15.5	61.2	0.176 2418	3770
	16	61 33 35.5	32 9.3	23.0	0 24 17.5	60.8	0.176 9956	3768
	18	62 37 47.5	32 2.6	24.8	0 26 18.7	60.3	0.177 7488	3764
	20	63 41 46.1	31 56.0	26.5	0 28 18.9	59.9	0.178 5013	3760
	22	64 45 31.4	31 49.4	+28.2	+0 30 18.1	+59.3	0.179 2527	+3754
	24	65 49 3.7	31 42.8	29.9	0 32 16.2	58.8	0.180 0027	3746
	26	66 52 22.8	31 36.3	31.5	0 34 13.3	58.3	0.180 7511	3738
	28	67 55 29.0	31 29.8	33.1	0 36 9.3	57.7	0.181 4978	3728
	30	68 58 22.2	31 23.4	34.6	0 38 4.1	57.1	0.182 2423	3717
Aug.	1	70 1 2.6	31 17.0	+36.1	+0 39 57.8	+56.6	0.182 9846	+3705
	3	71 3 30.2	31 10.6	37.6	0 41 50.3	56.0	0.183 7244	3692
	5	72 5 45.1	31 4.3	38.9	0 43 41.6	55.4	0.184 4613	3677
	7	73 7 47.4	30 58.0	40.2	0 45 31.7	54.8	0.185 1953	3662
	9	74 9 37.3	30 51.8	41.5	0 47 20.6	54.1	0.185 9260	3645
	11	75 11 14.7	30 45.7	+42.7	+0 49 8.2	+53.5	0.186 6583	+3628
	13	76 12 40.0	30 39.6	43.8	0 50 54.5	52.8	0.187 3770	3609
	15	77 13 53.0	30 33.5	44.9	0 52 39.4	52.1	0.188 0968	3589
	17	78 14 53.9	30 27.5	45.9	0 54 23.0	51.5	0.188 8126	3568
	19	79 15 42.9	30 21.6	46.9	0 56 5.2	50.8	0.189 5241	3546
	21	80 16 20.1	30 15.6	+47.8	+0 57 46.0	+50.1	0.190 2312	+3524
	23	81 16 45.4	30 9.8	48.6	0 59 25.5	49.4	0.190 9337	3500
	25	82 16 59.3	30 4.0	49.4	1 1 3.5	48.7	0.191 6313	3476
	27	83 17 1.6	29 58.3	50.1	1 2 40.1	48.0	0.192 3240	3451
	29	84 16 52.5	29 52.6	50.8	1 4 15.3	47.2	0.193 0116	3426
	31	85 16 32.2	29 47.1	+51.4	+1 5 49.0	+46.5	0.193 6938	+3397
Sept.	2	86 16 0.8	29 41.5	51.9	1 7 21.2	45.7	0.194 3704	3369
	4	87 15 18.4	29 36.1	52.3	1 8 51.9	45.0	0.195 0414	3340
	6	88 14 25.1	29 30.7	52.7	1 10 21.1	44.2	0.195 7065	3311
	8	89 13 21.1	29 25.3	53.1	1 11 48.8	43.5	0.196 3657	3281
	10	90 12 6.4	29 20.0	+53.3	+1 13 15.0	+42.7	0.197 0187	+3249
	12	91 10 41.3	29 14.9	53.5	1 14 39.7	41.9	0.197 6654	3218
	14	92 9 5.9	29 9.7	53.7	1 16 2.7	41.2	0.198 3057	3185
	16	93 7 20.2	29 4.6	53.8	1 17 24.3	40.4	0.198 9394	3152
	18	94 5 24.5	28 59.6	53.8	1 18 44.3	39.6	0.199 5663	3118
	20	95 3 18.8	28 54.7	+53.7	+1 20 2.7	+38.8	0.200 1865	+3083
	22	96 1 3.3	28 49.8	53.6	1 21 19.6	38.0	0.200 7996	3048
	24	96 58 38.2	28 45.1	53.5	1 22 34.8	37.2	0.201 4057	3012
	26	97 56 3.6	28 40.3	53.3	1 23 48.5	36.4	0.202 0044	2976
	28	98 53 19.6	28 35.7	53.0	1 25 0.5	35.6	0.202 5959	2939
	30	99 50 26.3	28 31.1	+52.6	+1 26 10.9	+34.8	0.203 1799	+2901
Oct.	2	100 47 24.0	28 26.6	+52.2	+1 27 19.8	+34.0	0.203 7563	+2863

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
Oct.	2	100 47 24.0	28 26.6	+52.2	+1 27 19.8	+34.0	0.203 7563	+2868
	4	101 44 12.8	28 22.2	51.8	1 28 27.1	33.2	0.204 3251	2824
	6	102 40 52.7	28 17.8	51.3	1 29 32.7	32.4	0.204 8859	2785
	8	103 37 24.0	28 13.5	50.7	1 30 36.7	31.6	0.205 4389	2745
	10	104 33 46.8	28 9.3	50.1	1 31 39.0	30.8	0.205 9839	2705
	12	105 30 1.2	28 5.1	+49.4	+1 32 39.7	+29.9	0.206 5207	+2664
	14	106 26 7.4	28 1.1	48.7	1 33 38.7	29.1	0.207 0494	2623
	16	107 22 5.5	27 57.1	48.0	1 34 36.2	28.3	0.207 5697	2581
	18	108 17 55.7	27 53.1	47.2	1 35 32.0	27.5	0.208 0817	2539
	20	109 13 38.1	27 49.3	46.3	1 36 26.2	26.7	0.208 5851	2496
	22	110 9 12.9	27 45.5	+45.4	+1 37 18.8	+25.9	0.209 0801	+2453
	24	111 4 40.1	27 41.8	44.4	1 38 9.8	25.1	0.209 5663	2409
	26	112 0 0.1	27 38.2	43.4	1 38 59.1	24.2	0.210 0438	2365
	28	112 55 12.9	27 34.6	42.4	1 39 46.7	23.4	0.210 5125	2322
	30	113 50 18.7	27 31.2	41.3	1 40 32.7	22.6	0.210 9724	2277
Nov.	1	114 45 17.6	27 27.7	+40.2	+1 41 17.1	+21.8	0.211 4233	+2232
	3	115 40 9.7	27 24.4	39.0	1 41 59.9	21.0	0.211 8651	2187
	5	116 34 55.3	27 21.2	37.8	1 42 40.9	20.1	0.212 2979	2141
	7	117 29 34.4	27 18.0	36.6	1 43 20.4	19.3	0.212 7215	2095
	9	118 24 7.2	27 14.9	35.3	1 43 58.2	18.5	0.213 1359	2049
	11	119 18 33.9	27 11.9	+34.0	+1 44 34.4	+17.7	0.213 5410	+2002
	13	120 12 54.7	27 8.9	32.7	1 45 9.0	16.9	0.213 9368	1955
	15	121 7 9.5	27 6.0	31.3	1 45 41.9	16.0	0.214 3232	1908
	17	122 1 18.7	27 3.2	29.9	1 46 13.1	15.2	0.214 7001	1861
	19	122 55 22.4	27 0.5	28.5	1 46 42.7	14.4	0.215 0675	1813
	21	123 49 20.7	26 57.8	+27.0	+1 47 10.7	+13.6	0.215 4254	+1765
	23	124 43 13.7	26 55.2	25.6	1 47 37.1	12.8	0.215 7737	1717
	25	125 37 1.7	26 52.7	24.1	1 48 1.8	12.0	0.216 1123	1669
	27	126 30 44.6	26 50.2	22.6	1 48 25.0	11.2	0.216 4412	1620
	29	127 24 22.8	26 48.0	21.1	1 48 46.6	10.4	0.216 7602	1571
Dec.	1	128 17 56.5	26 45.7	+19.5	+1 49 6.4	+ 9.5	0.217 0696	+1522
	3	129 11 25.6	26 43.5	17.9	1 49 24.7	8.8	0.217 3691	1473
	5	130 4 50.4	26 41.3	16.3	1 49 41.4	8.0	0.217 6587	1423
	7	130 58 11.0	26 39.3	14.7	1 49 56.5	7.2	0.217 9384	1374
	9	131 51 27.6	26 37.3	13.1	1 50 10.0	6.4	0.218 2082	1324
	11	132 44 40.2	26 35.4	+11.5	+1 50 21.9	+ 5.6	0.218 4681	+1274
	13	133 37 49.1	26 33.6	9.9	1 50 32.2	4.8	0.218 7178	1224
	15	134 30 54.5	26 31.8	8.2	1 50 40.9	4.0	0.218 9576	1174
	17	135 23 56.4	26 30.1	6.6	1 50 48.0	3.2	0.219 1873	1123
	19	136 16 55.0	26 28.5	5.0	1 50 53.5	2.4	0.219 4069	1073
	21	137 9 50.5	26 27.0	+ 3.3	+1 50 57.5	+ 1.6	0.219 6164	+1023
	23	138 2 43.0	26 25.5	+ 1.6	1 50 59.9	+ 0.8	0.219 8157	971
	25	138 55 32.7	26 24.2	0.0	1 51 0.7	0.0	0.220 0048	920
	27	139 48 19.7	26 22.9	- 1.6	1 50 59.8	- 0.8	0.220 1838	869
	29	140 41 4.2	26 21.6	3.3	1 50 57.5	1.6	0.220 3525	818
	31	141 33 46.3	26 20.5	- 4.9	+1 50 53.5	- 2.4	0.220 5110	+ 767
	33	142 26 26.1	26 19.4	- 6.6	+1 50 48.1	- 3.1	0.220 6592	+ 715

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit. Meridian of Greenwich.
	h	m	s								
Jan.	1	1 36	58.03	+0.356	+ 8 45 15.9	+2.89	0.665 0022	+607.4	20.36	1.90	6 53.6
	2	1 37	6.97	0.388	8 46 27.5	3.07	0.666 4607	607.9	20.29	1.90	6 49.8
	3	1 37	16.67	0.420	8 47 43.4	3.25	0.667 9203	608.3	20.22	1.89	6 46.1
	4	1 37	27.12	0.451	8 49 3.5	3.43	0.669 3806	608.6	20.15	1.88	6 42.3
	5	1 37	38.32	0.482	8 50 27.8	3.60	0.670 8412	608.6	20.08	1.88	6 38.6
	6	1 37	50.26	+0.513	+ 8 51 56.4	+3.78	0.672 3015	+608.4	20.02	1.87	6 34.8
	7	1 38	2.94	0.544	8 53 29.1	3.96	0.673 7612	608.0	19.95	1.87	6 31.1
	8	1 38	16.35	0.574	8 55 5.9	4.12	0.675 2199	607.5	19.88	1.86	6 27.4
	9	1 38	30.49	0.604	8 56 46.7	4.28	0.676 6772	606.9	19.82	1.85	6 23.7
	10	1 38	45.36	0.634	8 58 31.6	4.45	0.678 1327	606.1	19.75	1.85	6 20.0
	11	1 39	0.94	+0.664	+ 9 0 20.5	+4.62	0.679 5862	+605.1	19.68	1.84	6 16.4
	12	1 39	17.24	0.694	9 2 13.3	4.78	0.681 0371	604.0	19.62	1.83	6 12.7
	13	1 39	34.24	0.723	9 4 9.9	4.94	0.682 4852	602.7	19.55	1.83	6 9.1
	14	1 39	51.94	0.752	9 6 10.5	5.10	0.683 9301	601.3	19.49	1.82	6 5.4
	15	1 40	10.34	0.781	9 8 14.8	5.26	0.685 3713	599.7	19.42	1.82	6 1.8
	16	1 40	29.43	+0.810	+ 9 10 23.0	+5.42	0.686 8087	+598.0	19.36	1.81	5 58.2
	17	1 40	49.21	0.838	9 12 34.7	5.57	0.688 2418	596.2	19.29	1.80	5 54.6
	18	1 41	9.67	0.866	9 14 50.2	5.72	0.689 6703	594.2	19.23	1.80	5 51.0
	19	1 41	30.80	0.894	9 17 9.3	5.87	0.691 0939	592.1	19.17	1.79	5 47.4
	20	1 41	52.60	0.922	9 19 32.1	6.02	0.692 5122	589.8	19.11	1.79	5 43.9
	21	1 42	15.06	+0.950	+ 9 21 58.3	+6.17	0.693 9249	+587.4	19.04	1.78	5 40.3
	22	1 42	38.18	0.977	9 24 28.1	6.32	0.695 3317	584.9	18.98	1.77	5 36.8
	23	1 43	1.96	1.004	9 27 1.4	6.46	0.696 7322	582.2	18.92	1.77	5 33.2
	24	1 43	26.38	1.031	9 29 38.0	6.59	0.698 1260	579.3	18.86	1.76	5 29.7
	25	1 43	51.44	1.057	9 32 17.9	6.73	0.699 5129	576.4	18.80	1.76	5 26.2
	26	1 44	17.13	+1.084	+ 9 35 1.1	+6.87	0.700 8926	+573.3	18.74	1.75	5 22.7
	27	1 44	43.45	1.109	9 37 47.5	7.00	0.702 2647	570.1	18.68	1.75	5 19.2
	28	1 45	10.38	1.135	9 40 37.1	7.13	0.703 6290	566.8	18.62	1.74	5 15.7
	29	1 45	37.91	1.160	9 43 29.7	7.26	0.704 9853	563.4	18.56	1.74	5 12.2
	30	1 46	6.04	1.184	9 46 25.4	7.38	0.706 3333	559.9	18.51	1.73	5 8.8
	31	1 46	34.77	+1.209	+ 9 49 24.1	+7.51	0.707 6728	+556.3	18.45	1.72	5 5.3
Feb.	1	1 47	4.07	1.233	9 52 25.7	7.62	0.709 0035	552.6	18.39	1.72	5 1.9
	2	1 47	33.95	1.257	9 55 30.1	7.74	0.710 3252	548.8	18.34	1.71	4 58.4
	3	1 48	4.41	1.281	9 58 37.3	7.86	0.711 6377	544.9	18.28	1.71	4 55.0
	4	1 48	35.42	1.304	10 1 47.3	7.97	0.712 9408	541.0	18.23	1.70	4 51.6
	5	1 49	6.99	+1.327	+10 4 59.9	+8.08	0.714 2343	+536.9	18.17	1.70	4 48.2
	6	1 49	39.11	1.350	10 8 15.2	8.19	0.715 5181	532.9	18.12	1.69	4 44.8
	7	1 50	11.77	1.372	10 11 33.1	8.30	0.716 7921	528.8	18.07	1.69	4 41.4
	8	1 50	44.96	1.394	10 14 53.5	8.40	0.718 0561	524.5	18.01	1.68	4 38.0
	9	1 51	18.67	1.416	10 18 16.4	8.50	0.719 3098	520.2	17.96	1.68	4 34.6
	10	1 51	52.91	+1.437	+10 21 41.7	+8.60	0.720 5531	+515.9	17.91	1.67	4 31.3
	11	1 52	27.66	1.459	10 25 9.4	8.70	0.721 7859	511.4	17.86	1.67	4 27.9
	12	1 53	2.92	1.480	10 28 39.4	8.80	0.723 0079	506.9	17.81	1.66	4 24.6
	13	1 53	38.68	1.500	10 32 11.8	8.89	0.724 2192	502.4	17.76	1.66	4 21.2
	14	1 54	14.94	1.521	10 35 46.3	8.98	0.725 4195	497.8	17.71	1.66	4 17.9
	15	1 54	51.69	+1.541	+10 39 23.0	+9.07	0.726 6087	+493.1	17.66	1.65	4 14.6
	16	1 55	28.92	+1.561	+10 43 1.9	+9.16	0.727 7866	+488.4	17.62	1.65	4 11.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit. Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Feb. 16	1	55	28.92	+1.561	+10	43	1.9	+ 9.16	0.727 7866	+488.4	17.62	1.65	4 11.3
17	1	56	6.62	1.581	10	46	42.8	9.25	0.728 9530	483.6	17.57	1.64	4 8.0
18	1	56	44.79	1.600	10	50	25.8	9.33	0.730 1079	478.8	17.52	1.64	4 4.7
19	1	57	23.44	1.620	10	54	10.8	9.41	0.731 2510	473.9	17.48	1.63	4 1.4
20	1	58	2.55	1.639	10	57	57.7	9.49	0.732 3821	468.8	17.43	1.63	3 58.1
21	1	58	42.10	+1.657	+11	1	46.4	+ 9.57	0.733 5011	+463.7	17.38	1.63	3 54.8
22	1	59	22.10	1.676	11	5	36.9	9.64	0.734 6078	458.5	17.34	1.62	3 51.6
23	2	0	2.54	1.694	11	9	29.2	9.71	0.735 7021	453.3	17.30	1.62	3 48.3
24	2	0	43.40	1.711	11	13	23.2	9.78	0.736 7839	448.1	17.25	1.61	3 45.1
25	2	1	24.69	1.729	11	17	18.8	9.85	0.737 8530	442.8	17.21	1.61	3 41.8
26	2	2	6.40	+1.746	+11	21	16.0	+ 9.91	0.738 9094	+437.5	17.17	1.60	3 38.6
27	2	2	48.52	1.763	11	25	14.7	9.98	0.739 9530	432.1	17.13	1.60	3 35.3
28	2	3	31.04	1.780	11	29	15.0	10.04	0.740 9836	426.7	17.09	1.60	3 32.1
Mar. 1	2	4	13.96	1.796	11	33	16.7	10.10	0.742 0013	421.3	17.05	1.59	3 28.9
2	2	4	57.26	1.812	11	37	19.7	10.15	0.743 0069	415.8	17.01	1.59	3 25.7
3	2	5	40.94	+1.828	+11	41	24.1	+10.21	0.743 9972	+410.3	16.97	1.59	3 22.5
4	2	6	25.00	1.843	11	45	29.7	10.26	0.744 9754	404.8	16.93	1.58	3 19.3
5	2	7	9.42	1.858	11	49	36.5	10.31	0.745 9403	399.3	16.89	1.58	3 16.1
6	2	7	54.20	1.873	11	53	44.5	10.36	0.746 8920	393.8	16.86	1.58	3 12.9
7	2	8	39.34	1.888	11	57	53.7	10.40	0.747 8305	388.2	16.82	1.57	3 9.7
8	2	9	24.84	+1.903	+12	2	3.9	+10.45	0.748 7556	+382.7	16.79	1.57	3 6.5
9	2	10	10.68	1.917	12	6	15.2	10.49	0.749 6673	377.1	16.75	1.57	3 3.4
10	2	10	56.85	1.931	12	10	27.4	10.53	0.750 5655	371.4	16.72	1.56	3 0.2
11	2	11	43.36	1.944	12	14	40.6	10.57	0.751 4501	365.8	16.68	1.56	2 57.0
12	2	12	30.19	1.958	12	18	54.7	10.61	0.752 3211	360.1	16.65	1.56	2 53.9
13	2	13	17.35	+1.972	+12	23	9.7	+10.64	0.753 1784	+354.4	16.62	1.55	2 50.7
14	2	14	4.83	1.985	12	27	25.4	10.67	0.754 0220	348.7	16.58	1.55	2 47.6
15	2	14	52.62	1.998	12	31	42.0	10.71	0.754 8519	342.9	16.55	1.55	2 44.4
16	2	15	40.72	2.010	12	35	59.3	10.74	0.755 6680	337.2	16.52	1.54	2 41.3
17	2	16	29.12	2.023	12	40	17.3	10.76	0.756 4703	331.4	16.49	1.54	2 38.2
18	2	17	17.82	+2.036	+12	44	36.0	+10.79	0.757 2586	+325.6	16.46	1.54	2 35.1
19	2	18	6.82	2.047	12	48	55.3	10.82	0.758 0330	319.8	16.43	1.54	2 32.0
20	2	18	56.10	2.059	12	53	15.1	10.84	0.758 7984	313.9	16.40	1.53	2 28.8
21	2	19	45.67	2.071	12	57	35.4	10.86	0.759 5396	308.0	16.37	1.53	2 25.7
22	2	20	35.51	2.082	13	1	56.2	10.88	0.760 2717	302.1	16.35	1.53	2 22.6
23	2	21	25.62	+2.093	+13	6	17.5	+10.89	0.760 9895	+296.1	16.32	1.53	2 19.5
24	2	22	16.00	2.104	13	10	39.1	10.91	0.761 6929	290.1	16.29	1.52	2 16.4
25	2	23	6.64	2.115	13	15	1.1	10.92	0.762 3821	284.1	16.27	1.52	2 13.3
26	2	23	57.52	2.125	13	19	23.3	10.93	0.763 0568	278.1	16.24	1.52	2 10.2
27	2	24	48.65	2.135	13	23	45.8	10.94	0.763 7171	272.1	16.22	1.52	2 7.2
28	2	25	40.02	+2.145	+13	28	8.4	+10.95	0.764 3631	+266.1	16.19	1.51	2 4.1
29	2	26	31.63	2.155	13	32	31.2	10.96	0.764 9946	260.1	16.17	1.51	2 1.0
30	2	27	23.45	2.164	13	36	54.2	10.96	0.765 6117	254.1	16.15	1.51	1 57.9
31	2	28	15.50	2.173	13	41	17.2	10.96	0.766 2144	248.1	16.12	1.51	1 54.9
Apr. 1	2	29	7.77	2.182	13	45	40.3	10.96	0.766 8028	242.2	16.10	1.51	1 51.8
2	2	30	0.25	+2.191	+13	50	3.4	+10.96	0.767 3768	+236.2	16.08	1.50	1 48.7
3	2	30	52.94	+2.200	+13	54	26.5	+10.96	0.767 9363	+230.1	16.06	1.50	1 45.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"					h m
Apr.	1	2 29	7.77	+2.182	+13 45	40.3	+10.96	0.766 8028	+242.2	16.10	1.51	1 51.8	
	2	2 30	0.25	2.191	13 50	3.4	10.96	0.767 3768	236.2	16.08	1.50	1 48.7	
	3	2 30	52.94	2.200	13 54	26.5	10.96	0.767 9363	230.1	16.06	1.50	1 45.7	
	4	2 31	45.83	2.208	13 58	49.5	10.96	0.768 4814	224.1	16.04	1.50	1 42.6	
	5	2 32	38.92	2.216	14 3	12.4	10.95	0.769 0121	218.1	16.02	1.50	1 39.6	
	6	2 33	32.20	+2.224	+14 7	35.1	+10.94	0.769 5284	+212.1	16.00	1.50	1 36.5	
	7	2 34	25.66	2.231	14 11	57.7	10.94	0.770 0303	206.1	15.98	1.49	1 33.5	
	8	2 35	19.31	2.239	14 16	20.1	10.93	0.770 5179	200.2	15.96	1.49	1 30.4	
	9	2 36	13.14	2.247	14 20	42.2	10.92	0.770 9911	194.2	15.95	1.49	1 27.4	
	10	2 37	7.15	2.254	14 25	4.1	10.91	0.771 4500	188.2	15.93	1.49	1 24.4	
	11	2 38	1.32	+2.261	+14 29	25.7	+10.89	0.771 8944	+182.2	15.91	1.49	1 21.3	
	12	2 38	55.66	2.268	14 33	46.9	10.88	0.772 3244	176.2	15.90	1.49	1 18.3	
	13	2 39	50.15	2.274	14 38	7.8	10.86	0.772 7400	170.1	15.88	1.48	1 15.3	
	14	2 40	44.81	2.281	14 42	28.3	10.84	0.773 1411	164.1	15.87	1.48	1 12.3	
	15	2 41	39.62	2.287	14 46	48.3	10.82	0.773 5277	158.1	15.85	1.48	1 9.2	
	16	2 42	34.58	+2.293	+14 51	7.9	+10.81	0.773 8999	+152.1	15.84	1.48	1 6.2	
	17	2 43	29.69	2.299	14 55	27.0	10.79	0.774 2576	146.0	15.83	1.48	1 3.2	
	18	2 44	24.94	2.305	14 59	45.6	10.76	0.774 6007	139.9	15.82	1.48	1 0.2	
	19	2 45	20.32	2.311	15 4	3.7	10.74	0.774 9292	133.8	15.80	1.48	0 57.2	
	20	2 46	15.84	2.316	15 8	21.1	10.71	0.775 2431	127.8	15.79	1.48	0 54.2	
	21	2 47	11.48	+2.321	+15 12	37.9	+10.69	0.775 5424	+121.7	15.78	1.48	0 51.1	
	22	2 48	7.23	2.325	15 16	54.1	10.66	0.775 8270	115.5	15.77	1.47	0 48.1	
	23	2 49	3.10	2.330	15 21	9.5	10.63	0.776 0970	109.5	15.76	1.47	0 45.1	
	24	2 40	59.07	2.334	15 25	24.2	10.60	0.776 3524	103.4	15.75	1.47	0 42.1	
	25	2 50	55.15	2.338	15 29	38.1	10.56	0.776 5932	97.3	15.74	1.47	0 39.1	
	26	2 51	51.32	+2.342	+15 33	51.2	+10.53	0.776 8195	+ 91.2	15.73	1.47	0 36.1	
	27	2 52	47.59	2.346	15 38	3.5	10.50	0.777 0311	85.1	15.73	1.47	0 33.1	
	28	2 53	43.94	2.350	15 42	15.0	10.46	0.777 2282	79.1	15.72	1.47	0 30.1	
	29	2 54	40.38	2.353	15 46	25.6	10.42	0.777 4108	73.1	15.71	1.47	0 27.1	
	30	2 55	36.89	2.356	15 50	35.3	10.39	0.777 5789	67.0	15.71	1.47	0 24.1	
May	1	2 56	33.47	+2.359	+15 54	44.1	+10.35	0.777 7325	+ 61.0	15.70	1.47	0 21.2	
	2	2 57	30.12	2.362	15 58	52.0	10.31	0.777 8716	55.0	15.70	1.47	0 18.2	
	3	2 58	26.83	2.364	16 2	58.8	10.26	0.777 9963	49.0	15.69	1.47	0 15.2	
	4	2 59	23.60	2.367	16 7	4.7	10.22	0.778 1067	42.9	15.69	1.47	0 12.2	
	5	3 0	20.43	2.369	16 11	9.5	10.18	0.778 2027	37.0	15.68	1.47	0 9.2	
	6	3 1	17.31	+2.371	+16 15	13.3	+10.14	0.778 2845	+ 31.1	15.68	1.47	0 6.2	
	7	3 2	14.24	2.373	16 19	16.0	10.09	0.778 3519	25.1	15.68	1.47	0 3.2	
	8	3 3	11.22	2.375	16 23	17.6	10.04	0.778 4051	19.2	15.68	1.47	0 0.2	
	9	3 4	8.23	2.376	16 27	18.1	10.00	0.778 4439	13.2	15.68	1.47	23 54.2	
	10	3 5	5.27	2.378	16 31	17.5	9.95	0.778 4684	7.3	15.68	1.47	23 51.3	
	11	3 6	2.35	+2.379	+16 35	15.7	+ 9.90	0.778 4787	+ 1.3	15.67	1.47	23 48.3	
	12	3 6	59.45	2.380	16 39	12.8	9.85	0.778 4746	- 4.7	15.67	1.47	23 45.3	
	13	3 7	56.57	2.381	16 43	8.7	9.80	0.778 4562	10.6	15.68	1.47	23 42.3	
	14	3 8	53.72	2.381	16 47	3.3	9.75	0.778 4235	16.6	15.68	1.47	23 39.3	
	15	3 9	50.88	2.382	16 50	56.7	9.70	0.778 3764	22.6	15.68	1.47	23 36.3	
	16	3 10	48.05	+2.382	+16 54	48.9	+ 9.65	0.778 3150	- 28.6	15.68	1.47	23 33.3	
	17	3 11	45.23	+2.382	+16 58	39.8	+ 9.59	0.778 2392	- 34.6	15.68	1.47	23 30.3	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.			
	h	m	s	s	°	'	"	"			"	"	h	m	
May	17	3	11	45.23	+2.382	+16	58	39.8	+9.59	0.778 2392	- 34.6	15.68	1.47	23	30.3
	18	3	12	42.40	2.382	17	2	29.4	9.54	0.778 1491	40.5	15.69	1.47	23	27.4
	19	3	13	39.57	2.382	17	6	17.6	9.48	0.778 0446	46.5	15.69	1.47	23	24.4
	20	3	14	36.72	2.381	17	10	4.5	9.42	0.777 9257	52.5	15.69	1.47	23	21.4
	21	3	15	33.86	2.380	17	13	50.0	9.37	0.777 7925	58.5	15.70	1.47	23	18.4
	22	3	16	30.98	+2.379	+17	17	34.1	+9.31	0.777 6449	- 64.5	15.70	1.47	23	15.5
	23	3	17	28.07	2.378	17	21	16.8	9.25	0.777 4829	70.5	15.71	1.47	23	12.5
	24	3	18	25.12	2.376	17	24	58.1	9.19	0.777 3067	76.4	15.72	1.47	23	9.5
	25	3	19	22.13	2.375	17	28	37.9	9.13	0.777 1162	82.3	15.72	1.47	23	6.5
	26	3	20	19.10	2.373	17	32	16.3	9.07	0.776 9116	88.2	15.73	1.47	23	3.5
	27	3	21	16.01	+2.370	+17	35	53.1	+9.00	0.776 6927	- 94.1	15.74	1.47	23	0.5
June	28	3	22	12.88	2.368	17	39	28.5	8.94	0.776 4598	100.0	15.75	1.47	22	57.5
	29	3	23	9.68	2.365	17	43	2.3	8.88	0.776 2128	105.9	15.76	1.47	22	54.5
	30	3	24	6.42	2.363	17	46	34.6	8.81	0.775 9517	111.7	15.77	1.47	22	51.5
	31	3	25	3.09	2.360	17	50	5.3	8.75	0.775 6766	117.6	15.78	1.47	22	48.5
	1	3	25	59.69	+2.357	+17	53	34.5	+8.68	0.775 3875	-123.4	15.79	1.48	22	45.5
	2	3	26	56.21	2.353	17	57	2.1	8.62	0.775 0844	129.2	15.80	1.48	22	42.5
	3	3	27	52.64	2.350	18	0	28.1	8.55	0.774 7675	134.9	15.81	1.48	22	39.5
	4	3	28	48.99	2.346	18	3	52.5	8.48	0.774 4366	140.7	15.82	1.48	22	36.5
	5	3	29	45.24	2.342	18	7	15.3	8.42	0.774 0920	146.5	15.83	1.48	22	33.5
	6	3	30	41.40	+2.338	+18	10	36.5	+8.35	0.773 7334	-152.3	15.85	1.48	22	30.6
	7	3	31	37.46	2.334	18	13	56.1	8.28	0.773 3610	158.1	15.86	1.48	22	27.6
	8	3	32	33.42	2.329	18	17	14.0	8.21	0.772 9748	163.8	15.87	1.48	22	24.6
	9	3	33	29.27	2.325	18	20	30.2	8.14	0.772 5748	169.5	15.89	1.49	22	21.5
	10	3	34	25.01	2.320	18	23	44.8	8.07	0.772 1610	175.3	15.90	1.49	22	18.5
	11	3	35	20.63	+2.315	+18	26	57.7	+8.00	0.771 7335	-181.0	15.92	1.49	22	15.5
	12	3	36	16.13	2.310	18	30	9.0	7.93	0.771 2921	186.8	15.94	1.49	22	12.5
	13	3	37	11.49	2.304	18	33	18.5	7.86	0.770 8369	192.6	15.95	1.49	22	9.5
	14	3	38	6.72	2.298	18	36	26.3	7.79	0.770 3678	198.4	15.97	1.49	22	6.5
	15	3	39	1.81	2.293	18	39	32.4	7.72	0.769 8848	204.1	15.99	1.49	22	3.5
	16	3	39	56.76	+2.286	+18	42	36.7	+7.64	0.769 3880	-209.9	16.01	1.50	22	0.4
17	3	40	51.54	2.279	18	45	39.3	7.57	0.768 8775	215.6	16.03	1.50	21	57.4	
18	3	41	46.17	2.273	18	48	40.0	7.50	0.768 3531	221.3	16.04	1.50	21	54.4	
19	3	42	40.63	2.266	18	51	39.1	7.42	0.767 8151	227.0	16.06	1.50	21	51.3	
20	3	43	34.92	2.258	18	54	36.3	7.35	0.767 2634	232.7	16.08	1.50	21	48.3	
21	3	44	29.02	+2.250	+18	57	31.8	+7.27	0.766 6981	-238.4	16.10	1.51	21	45.3	
22	3	45	22.94	2.243	19	0	25.4	7.20	0.766 1193	244.0	16.13	1.51	21	42.2	
23	3	46	16.67	2.235	19	3	17.2	7.12	0.765 5270	249.6	16.15	1.51	21	39.2	
24	3	47	10.21	2.227	19	6	7.2	7.05	0.764 9211	255.2	16.17	1.51	21	36.1	
25	3	48	3.54	2.218	19	8	55.4	6.97	0.764 3019	260.7	16.19	1.51	21	33.0	
26	3	48	56.66	+2.209	+19	11	41.8	+6.89	0.763 6692	-266.4	16.22	1.52	21	30.0	
27	3	49	49.56	2.200	19	14	26.3	6.82	0.763 0232	271.9	16.24	1.52	21	27.0	
28	3	50	42.25	2.190	19	17	9.1	6.74	0.762 3640	277.4	16.27	1.52	21	23.9	
29	3	51	34.70	2.181	19	19	49.9	6.66	0.761 6917	282.9	16.29	1.52	21	20.8	
30	3	52	26.93	2.171	19	22	29.0	6.59	0.761 0062	288.3	16.32	1.53	21	17.8	
July	1	3	53	18.92	+2.161	+19	25	6.2	+6.51	0.760 3077	-293.8	16.34	1.53	21	14.7
	2	3	54	10.67	+2.151	+19	27	41.5	+6.43	0.759 5962	-299.2	16.37	1.53	21	11.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"			"	"	h	m	
July	1	3	53	18.92	+2.161	+19	25	6.2	+6.61	0.760 3077	-293.8	16.34	1.53	21	14.7
	2	3	54	10.67	2.151	19	27	41.5	6.43	0.759 5962	299.2	16.37	1.53	21	11.6
	3	3	55	2.17	2.140	19	30	14.9	6.35	0.758 8717	304.5	16.40	1.53	21	8.6
	4	3	55	53.41	2.130	19	32	46.5	6.28	0.758 1344	309.9	16.43	1.54	21	5.5
	5	3	56	44.40	2.119	19	35	16.2	6.20	0.757 3842	315.3	16.45	1.54	21	2.4
	6	3	57	35.12	+2.108	+19	37	44.1	+6.12	0.756 6210	-320.6	16.48	1.54	20	59.3
	7	3	58	25.58	2.096	19	40	10.2	6.05	0.755 8451	326.0	16.51	1.54	20	56.2
	8	3	59	15.75	2.085	19	42	34.3	5.97	0.755 0564	331.3	16.54	1.55	20	53.1
	9	4	0	5.65	2.073	19	44	56.6	5.89	0.754 2549	336.6	16.57	1.55	20	50.0
	10	4	0	55.27	2.061	19	47	17.0	5.81	0.753 4407	341.9	16.60	1.55	20	46.9
	11	4	1	44.59	+2.049	+19	49	35.6	+5.74	0.752 6138	-347.2	16.64	1.56	20	43.7
	12	4	2	33.60	2.036	19	51	52.3	5.66	0.751 7742	352.5	16.67	1.56	20	40.6
	13	4	3	22.31	2.023	19	54	7.1	5.58	0.750 9220	357.7	16.70	1.56	20	37.5
	14	4	4	10.69	2.009	19	56	19.9	5.50	0.750 0571	363.0	16.73	1.56	20	34.4
	15	4	4	58.75	1.995	19	58	30.9	5.42	0.749 1796	368.3	16.77	1.57	20	31.2
	16	4	5	46.47	+1.981	+20	0	40.0	+5.34	0.748 2895	-373.4	16.80	1.57	20	28.1
	17	4	6	33.86	1.967	20	2	47.2	5.26	0.747 3872	378.5	16.84	1.57	20	24.9
	18	4	7	20.90	1.952	20	4	52.6	5.18	0.746 4727	383.6	16.87	1.58	20	21.8
	19	4	8	7.58	1.938	20	6	56.0	5.10	0.745 5459	388.7	16.91	1.58	20	18.6
	20	4	8	53.90	1.922	20	8	57.6	5.03	0.744 6071	393.7	16.95	1.58	20	15.4
	21	4	9	39.84	+1.906	+20	10	57.3	+4.95	0.743 6562	-398.7	16.98	1.59	20	12.3
	22	4	10	25.41	1.891	20	12	55.0	4.87	0.742 6935	403.6	17.02	1.59	20	9.1
	23	4	11	10.59	1.874	20	14	50.9	4.79	0.741 7189	408.5	17.06	1.59	20	5.9
	24	4	11	55.38	1.858	20	16	44.9	4.71	0.740 7326	413.4	17.10	1.60	20	2.7
	25	4	12	39.77	1.841	20	18	37.0	4.63	0.739 7348	418.1	17.14	1.60	19	59.5
	26	4	13	23.75	+1.824	+20	20	27.3	+4.55	0.738 7255	-422.9	17.18	1.61	19	56.3
	27	4	14	7.32	1.807	20	22	15.6	4.48	0.737 7049	427.6	17.22	1.61	19	53.1
	28	4	14	50.47	1.789	20	24	2.1	4.40	0.736 6731	432.2	17.26	1.61	19	49.9
	29	4	15	33.20	1.771	20	25	46.8	4.32	0.735 6302	436.8	17.30	1.62	19	46.6
	30	4	16	15.49	1.753	20	27	29.6	4.25	0.734 5764	441.4	17.34	1.62	19	43.4
	31	4	16	57.34	+1.734	+20	29	10.6	+4.17	0.733 5116	-445.9	17.39	1.63	19	40.1
Aug.	1	4	17	38.74	1.716	20	30	49.7	4.09	0.732 4361	450.4	17.43	1.63	19	36.9
	2	4	18	19.69	1.697	20	32	27.0	4.01	0.731 3499	454.8	17.47	1.63	19	33.6
	3	4	19	0.18	1.677	20	34	2.4	3.94	0.730 2531	459.2	17.52	1.64	19	30.4
	4	4	19	40.20	1.658	20	35	36.0	3.86	0.729 1458	463.5	17.56	1.64	19	27.1
	5	4	20	19.74	+1.638	+20	37	7.7	+3.78	0.728 0281	-467.8	17.61	1.65	19	23.8
	6	4	20	58.80	1.617	20	38	37.6	3.71	0.726 9001	472.1	17.65	1.65	19	20.5
	7	4	21	37.37	1.597	20	40	5.7	3.63	0.725 7619	476.4	17.70	1.65	19	17.2
	8	4	22	15.44	1.576	20	41	32.0	3.56	0.724 6136	480.5	17.74	1.66	19	13.9
	9	4	22	53.00	1.554	20	42	56.4	3.48	0.723 4554	484.6	17.79	1.66	19	10.6
	10	4	23	30.05	+1.533	+20	44	19.1	+3.41	0.722 2874	-488.7	17.84	1.67	19	7.3
	11	4	24	6.58	1.511	20	45	39.9	3.33	0.721 1096	492.7	17.89	1.67	19	3.9
	12	4	24	42.57	1.488	20	46	58.9	3.25	0.719 9223	496.7	17.94	1.68	19	0.6
	13	4	25	18.02	1.465	20	48	16.1	3.18	0.718 7257	500.5	17.99	1.68	18	57.2
	14	4	25	52.91	1.442	20	49	31.5	3.11	0.717 5199	504.3	18.04	1.69	18	53.9
	15	4	26	27.24	+1.419	+20	50	45.2	+3.03	0.716 3051	-508.0	18.09	1.69	18	50.5
	16	4	27	1.01	+1.395	+20	51	57.1	+2.96	0.715 0815	-511.6	18.14	1.70	18	47.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"			"	"	h	m
Aug.	16	4	27	1.01	+1.395	+20	51	57.1	+2.96	0.715 0815	-511.6	18.14	1.70	18 47.1
	17	4	27	34.19	1.370	20	53	7.1	2.88	0.713 8494	515.1	18.19	1.70	18 43.7
	18	4	28	6.79	1.346	20	54	15.4	2.81	0.712 6089	518.6	18.24	1.71	18 40.3
	19	4	28	38.79	1.321	20	55	22.0	2.74	0.711 3603	521.9	18.29	1.71	18 36.9
	20	4	29	10.19	1.295	20	56	26.7	2.66	0.710 1037	525.2	18.35	1.72	18 33.5
	21	4	29	40.97	+1.270	+20	57	29.7	+2.59	0.708 8394	-528.4	18.40	1.72	18 30.1
	22	4	30	11.14	1.244	20	58	31.0	2.52	0.707 5676	531.4	18.45	1.73	18 26.6
	23	4	30	40.68	1.218	20	59	30.5	2.44	0.706 2886	534.4	18.51	1.73	18 23.2
	24	4	31	9.58	1.191	21	0	28.3	2.37	0.705 0026	537.2	18.56	1.74	18 19.7
	25	4	31	37.84	1.164	21	1	24.4	2.30	0.703 7098	540.0	18.62	1.74	18 16.2
Sept.	26	4	32	5.46	+1.137	+21	2	18.8	+2.23	0.702 4106	-542.6	18.68	1.75	18 12.8
	27	4	32	32.42	1.110	21	3	11.4	2.16	0.701 1051	545.2	18.73	1.75	18 9.3
	28	4	32	58.72	1.082	21	4	2.4	2.09	0.699 7937	547.6	18.79	1.76	18 5.8
	29	4	33	24.34	1.054	21	4	51.6	2.02	0.698 4765	550.0	18.85	1.76	18 2.3
	30	4	33	49.29	1.025	21	5	39.2	1.95	0.697 1538	552.2	18.90	1.77	17 58.7
	31	4	34	13.56	+0.997	+21	6	25.0	+1.88	0.695 8258	-554.4	18.96	1.77	17 55.2
	1	4	34	37.14	0.968	21	7	9.2	1.81	0.694 4928	556.4	19.02	1.78	17 51.6
	2	4	35	0.01	0.939	21	7	51.7	1.74	0.693 1551	558.3	19.08	1.78	17 48.1
	3	4	35	22.19	0.909	21	8	32.6	1.67	0.691 8129	560.2	19.14	1.79	17 44.5
	4	4	35	43.65	0.879	21	9	11.8	1.60	0.690 4664	561.9	19.20	1.79	17 40.9
	5	4	36	4.39	+0.849	+21	9	49.3	+1.53	0.689 1159	-563.5	19.26	1.80	17 37.3
	6	4	36	24.40	0.818	21	10	25.1	1.46	0.687 7618	564.9	19.32	1.81	17 33.7
	7	4	36	43.67	0.788	21	10	59.3	1.39	0.686 4043	566.3	19.38	1.81	17 30.1
	8	4	37	2.20	0.756	21	11	31.9	1.32	0.685 0437	567.5	19.44	1.82	17 26.5
	9	4	37	19.97	0.725	21	12	2.8	1.25	0.683 6803	568.6	19.50	1.82	17 22.8
	10	4	37	36.98	+0.693	+21	12	32.1	+1.19	0.682 3146	-569.5	19.56	1.83	17 19.2
	11	4	37	53.22	0.660	21	12	59.8	1.12	0.680 9470	570.2	19.62	1.83	17 15.5
	12	4	38	8.68	0.628	21	13	25.8	1.05	0.679 5777	570.8	19.68	1.84	17 11.8
	13	4	38	23.36	0.595	21	13	50.2	0.98	0.678 2072	571.2	19.75	1.85	17 8.1
	14	4	38	37.24	0.562	21	14	13.0	0.92	0.676 8359	571.5	19.81	1.85	17 4.4
15	4	38	50.33	+0.529	+21	14	34.2	+0.85	0.675 4642	-571.6	19.87	1.86	17 0.7	
16	4	39	2.61	0.495	21	14	53.7	0.78	0.674 0925	571.5	19.93	1.86	16 57.0	
17	4	39	14.08	0.461	21	15	11.7	0.71	0.672 7212	571.2	20.00	1.87	16 53.2	
18	4	39	24.74	0.427	21	15	28.0	0.65	0.671 3509	570.7	20.06	1.88	16 49.4	
19	4	39	34.58	0.393	21	15	42.8	0.58	0.669 9820	570.0	20.12	1.88	16 45.7	
20	4	39	43.59	+0.358	+21	15	55.9	+0.51	0.668 6148	-569.2	20.19	1.89	16 41.9	
21	4	39	51.78	0.324	21	16	7.5	0.45	0.667 2499	568.2	20.25	1.89	16 38.1	
22	4	39	59.14	0.289	21	16	17.4	0.38	0.665 8877	567.0	20.31	1.90	16 34.2	
23	4	40	5.67	0.254	21	16	25.8	0.32	0.664 5287	565.5	20.38	1.90	16 30.4	
24	4	40	11.35	0.219	21	16	32.6	0.25	0.663 1733	563.9	20.44	1.91	16 26.6	
25	4	40	16.20	+0.184	+21	16	37.9	+0.19	0.661 8220	-562.1	20.50	1.92	16 22.7	
26	4	40	20.20	0.149	21	16	41.5	0.12	0.660 4753	560.1	20.57	1.92	16 18.8	
27	4	40	23.36	0.114	21	16	43.6	+0.05	0.659 1337	557.9	20.63	1.93	16 14.9	
28	4	40	25.67	0.078	21	16	44.1	-0.01	0.657 7976	555.5	20.70	1.94	16 11.0	
29	4	40	27.13	0.043	21	16	43.1	0.08	0.656 4675	552.9	20.76	1.94	16 7.1	
30	4	40	27.74	+0.008	+21	16	40.4	-0.14	0.655 1439	-550.1	20.82	1.95	16 3.2	
Oct. 1	4	40	27.50	-0.028	+21	16	36.2	-0.21	0.653 8271	-547.2	20.89	1.95	15 59.2	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Paral-lax.	Transit, Meridian of Green-wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m	
Oct.	1	4	40	27.50	-0.028	+21	16	36.2	-0.21	0.653 8271	-547.2	20.89	1.95	15	59.2
	2	4	40	26.41	0.063	21	16	30.5	0.27	0.652 5178	543.9	20.95	1.96	15	55.3
	3	4	40	24.46	0.099	21	16	23.2	0.34	0.651 2163	540.6	21.01	1.96	15	51.3
	4	4	40	21.66	0.135	21	16	14.3	0.40	0.649 9232	537.0	21.07	1.97	15	47.3
	5	4	40	18.00	0.170	21	16	3.9	0.47	0.648 6390	533.1	21.14	1.98	15	43.3
	6	4	40	13.48	-0.206	+21	15	51.8	-0.53	0.647 3644	-529.0	21.20	1.98	15	39.3
	7	4	40	8.11	0.242	21	15	38.2	0.60	0.646 0998	524.7	21.26	1.99	15	35.3
	8	4	40	1.87	0.278	21	15	23.1	0.66	0.644 8459	520.2	21.32	1.99	15	31.2
	9	4	39	54.77	0.314	21	15	6.4	0.73	0.643 6032	515.4	21.38	2.00	15	27.2
	10	4	39	46.82	0.349	21	14	48.1	0.79	0.642 3724	510.3	21.44	2.00	15	23.1
	11	4	39	38.01	-0.385	+21	14	28.3	-0.86	0.641 1540	-505.1	21.50	2.01	15	19.0
	12	4	39	28.35	0.420	21	14	6.9	0.92	0.639 9487	499.4	21.56	2.02	15	14.9
	13	4	39	17.85	0.455	21	13	44.0	0.99	0.638 7570	493.6	21.62	2.02	15	10.8
	14	4	39	6.50	0.490	21	13	19.5	1.05	0.637 5796	487.5	21.68	2.03	15	6.6
	15	4	38	54.32	0.525	21	12	53.5	1.12	0.636 4172	481.1	21.74	2.03	15	2.5
	16	4	38	41.31	-0.559	+21	12	25.9	-1.18	0.635 2703	-474.5	21.80	2.04	14	58.4
	17	4	38	27.47	0.594	21	11	56.8	1.24	0.634 1396	467.7	21.85	2.04	14	54.2
	18	4	38	12.82	0.628	21	11	26.3	1.31	0.633 0256	460.6	21.91	2.05	14	50.0
	19	4	37	57.35	0.661	21	10	54.1	1.37	0.631 9291	453.2	21.96	2.05	14	45.8
	20	4	37	41.09	0.694	21	10	20.5	1.43	0.630 8506	445.5	22.02	2.06	14	41.6
	21	4	37	24.04	-0.726	+21	9	45.3	-1.50	0.629 7907	-437.7	22.07	2.06	14	37.4
	22	4	37	6.22	0.759	21	9	8.7	1.56	0.628 7501	429.5	22.13	2.07	14	33.2
	23	4	36	47.62	0.791	21	8	30.5	1.62	0.627 7292	421.2	22.18	2.07	14	28.9
	24	4	36	28.27	0.822	21	7	50.9	1.68	0.626 7287	412.6	22.23	2.08	14	24.6
	25	4	36	8.18	0.852	21	7	9.9	1.74	0.625 7491	403.7	22.28	2.08	14	20.4
	26	4	35	47.36	-0.882	+21	6	27.4	-1.80	0.624 7910	-394.7	22.33	2.09	14	16.1
	27	4	35	25.82	0.912	21	5	43.5	1.86	0.623 8548	385.4	22.38	2.09	14	11.8
	28	4	35	3.58	0.941	21	4	58.1	1.92	0.622 9413	375.9	22.43	2.10	14	7.5
	29	4	34	40.65	0.970	21	4	11.2	1.98	0.622 0508	366.2	22.47	2.10	14	3.2
	30	4	34	17.04	0.998	21	3	23.0	2.04	0.621 1839	356.2	22.52	2.11	13	58.9
31	4	33	52.76	-1.025	+21	2	33.4	-2.10	0.620 3411	-346.1	22.56	2.11	13	54.5	
Nov.	1	4	33	27.84	1.052	21	1	42.4	2.15	0.619 5230	335.8	22.60	2.11	13	50.2
	2	4	33	2.28	1.078	21	0	50.1	2.21	0.618 7301	325.0	22.64	2.12	13	45.8
	3	4	32	36.10	1.104	20	59	56.5	2.26	0.617 9630	314.2	22.68	2.12	13	41.4
	4	4	32	9.32	1.128	20	59	1.6	2.31	0.617 2221	303.2	22.72	2.12	13	37.0
	5	4	31	41.96	-1.152	+20	58	5.4	-2.37	0.616 5080	-291.9	22.76	2.13	13	32.6
	6	4	31	14.03	1.175	20	57	7.9	2.42	0.615 8212	280.4	22.80	2.13	13	28.2
	7	4	30	45.55	1.198	20	56	9.1	2.47	0.615 1622	268.7	22.83	2.13	13	23.8
	8	4	30	16.54	1.219	20	55	9.1	2.52	0.614 5315	256.8	22.86	2.14	13	19.4
	9	4	29	47.03	1.240	20	54	7.9	2.57	0.613 9296	244.7	22.90	2.14	13	15.0
	10	4	29	17.03	-1.260	+20	53	5.5	-2.62	0.613 3570	-232.4	22.93	2.14	13	10.5
	11	4	28	46.56	1.279	20	52	1.9	2.67	0.612 8141	219.9	22.95	2.15	13	6.1
	12	4	28	15.65	1.297	20	50	57.3	2.71	0.612 3014	207.3	22.98	2.15	13	1.6
	13	4	27	44.33	1.313	20	49	51.7	2.75	0.611 8192	194.5	23.01	2.15	12	57.2
	14	4	27	12.61	1.329	20	48	45.1	2.79	0.611 3680	181.5	23.03	2.15	12	52.8
	15	4	26	40.52	-1.344	+20	47	37.6	-2.83	0.610 9481	-168.4	23.05	2.16	12	48.3
	16	4	26	8.08	-1.358	+20	46	29.1	-2.88	0.610 5600	-155.1	23.07	2.16	12	43.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"			"	"	h	m
Nov. 16	4	26	8.08	-1.358	+20	46	29.1	-2.87	0.610 5600	-155.1	23.07	2.16	12	43.8
17	4	25	35.32	1.371	20	45	19.8	2.91	0.610 2038	141.7	23.09	2.16	12	39.3
18	4	25	2.27	1.382	20	44	9.6	2.94	0.609 8800	128.1	23.11	2.16	12	34.9
19	4	24	28.96	1.393	20	42	58.7	2.97	0.609 5887	114.6	23.13	2.16	12	30.4
20	4	23	55.40	1.403	20	41	47.0	3.00	0.609 3301	100.9	23.14	2.16	12	25.9
21	4	23	21.64	-1.411	+20	40	34.6	-3.03	0.609 1044	-87.1	23.15	2.16	12	21.4
22	4	22	47.69	1.418	20	39	21.6	3.06	0.608 9118	73.4	23.16	2.17	12	16.9
23	4	22	13.57	1.424	20	38	8.1	3.08	0.608 7523	59.5	23.17	2.17	12	12.4
24	4	21	39.33	1.429	20	36	54.0	3.10	0.608 6262	45.6	23.18	2.17	12	7.9
25	4	21	4.97	1.433	20	35	39.5	3.11	0.608 5334	31.7	23.18	2.17	12	3.4
26	4	20	30.54	-1.436	+20	34	24.5	-3.13	0.608 4741	-17.7	23.18	2.17	11	58.9
27	4	19	56.05	1.438	20	33	9.2	3.14	0.608 4483	-3.8	23.19	2.17	11	54.4
28	4	19	21.53	1.439	20	31	53.7	3.15	0.608 4561	+10.2	23.19	2.17	11	49.9
29	4	18	47.00	1.438	20	30	37.9	3.16	0.608 4975	24.2	23.18	2.17	11	45.4
30	4	18	12.49	1.437	20	29	22.0	3.17	0.608 5725	38.2	23.18	2.17	11	40.9
Dec. 1	4	17	38.03	-1.434	+20	28	5.9	-3.17	0.608 6810	+52.2	23.18	2.17	11	36.4
2	4	17	3.65	1.431	20	26	49.9	3.17	0.608 8231	66.2	23.18	2.17	11	31.9
3	4	16	29.36	1.426	20	25	33.9	3.17	0.608 9987	80.1	23.16	2.17	11	27.4
4	4	15	55.20	1.421	20	24	17.9	3.16	0.609 2077	94.0	23.15	2.16	11	22.9
5	4	15	21.18	1.414	20	23	2.2	3.15	0.609 4501	107.9	23.13	2.16	11	18.4
6	4	14	47.34	-1.406	+20	21	46.6	-3.14	0.609 7257	+121.7	23.12	2.16	11	13.9
7	4	14	13.71	1.397	20	20	31.4	3.13	0.610 0344	135.5	23.10	2.16	11	9.4
8	4	13	40.30	1.387	20	19	16.5	3.11	0.610 3761	149.2	23.08	2.16	11	4.9
9	4	13	7.14	1.376	20	18	2.2	3.09	0.610 7505	162.8	23.06	2.16	11	0.4
10	4	12	34.27	1.363	20	16	48.3	3.06	0.611 1576	176.3	23.04	2.15	10	56.0
11	4	12	1.70	-1.350	+20	15	35.1	-3.04	0.611 5969	+189.8	23.02	2.15	10	51.5
12	4	11	29.46	1.336	20	14	22.5	3.01	0.612 0684	203.1	22.99	2.15	10	47.0
13	4	10	57.58	1.320	20	13	10.6	2.98	0.612 5717	216.3	22.97	2.15	10	42.6
14	4	10	26.08	1.304	20	11	59.6	2.94	0.613 1064	229.3	22.94	2.14	10	38.1
15	4	9	54.99	1.286	20	10	49.5	2.90	0.613 6722	242.2	22.91	2.14	10	33.7
16	4	9	24.33	-1.268	+20	9	40.4	-2.86	0.614 2687	+254.9	22.88	2.14	10	29.2
17	4	8	54.12	1.249	20	8	32.3	2.82	0.614 8955	267.4	22.85	2.14	10	24.8
18	4	8	24.39	1.228	20	7	25.2	2.77	0.615 5522	279.8	22.81	2.13	10	20.4
19	4	7	55.16	1.207	20	6	19.4	2.72	0.616 2383	291.9	22.77	2.13	10	16.0
20	4	7	26.45	1.185	20	5	14.8	2.66	0.616 9533	303.8	22.74	2.13	10	11.6
21	4	6	58.28	-1.162	+20	4	11.5	-2.61	0.617 6968	+315.6	22.70	2.12	10	7.2
22	4	6	30.67	1.138	20	3	9.6	2.55	0.618 4681	327.1	22.66	2.12	10	2.8
23	4	6	3.64	1.114	20	2	9.1	2.49	0.619 2668	338.4	22.62	2.11	9	58.4
24	4	5	37.20	1.089	20	1	10.1	2.43	0.620 0924	349.5	22.57	2.11	9	54.1
25	4	5	11.37	1.063	20	0	12.6	2.36	0.620 9443	360.3	22.53	2.11	9	49.7
26	4	4	46.16	-1.037	+19	59	16.7	-2.29	0.621 8220	+371.0	22.48	2.10	9	45.4
27	4	4	21.59	1.010	19	58	22.5	2.22	0.622 7250	381.4	22.44	2.10	9	41.0
28	4	3	57.68	0.982	19	57	30.0	2.15	0.623 6526	391.6	22.39	2.09	9	36.7
29	4	3	34.44	0.954	19	56	39.3	2.08	0.624 6045	401.6	22.34	2.09	9	32.4
30	4	3	11.89	0.925	19	55	50.4	2.00	0.625 5800	411.3	22.29	2.08	9	28.1
31	4	2	50.04	-0.896	+19	55	3.4	-1.92	0.626 5786	+420.8	22.24	2.08	9	23.8
32	4	2	28.89	...	+19	54	18.3	...	0.627 6000	...	22.19	2.07	9	19.5

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
Jan.	1	36 39 41.0	5 27.38	-21.8	-1 9 54.8	+3.40	0.696 5008	+126.6
	5	37 1 30.4	5 27.30	22.0	1 9 41.1	3.44	0.696 5518	128.4
	9	37 23 19.4	5 27.22	22.2	1 9 27.3	3.48	0.696 6035	130.2
	13	37 45 8.1	5 27.14	22.3	1 9 13.3	3.52	0.696 6560	132.1
	17	38 6 56.5	5 27.06	22.5	1 8 59.1	3.57	0.696 7092	133.9
	21	38 28 44.6	5 26.98	-22.7	-1 8 44.7	+3.61	0.696 7631	+135.8
	25	38 50 32.3	5 26.89	22.9	1 8 30.2	3.65	0.696 8178	137.5
Feb.	29	39 12 19.7	5 26.81	23.1	1 8 15.5	3.69	0.696 8731	139.3
	2	39 34 6.8	5 26.72	23.2	1 8 0.7	3.73	0.696 9292	141.1
	6	39 55 53.5	5 26.64	23.4	1 7 45.7	3.77	0.696 9860	142.9
	10	40 17 39.9	5 26.55	-23.6	-1 7 30.5	+3.81	0.697 0435	+144.5
	14	40 39 25.9	5 26.46	23.7	1 7 15.2	3.84	0.697 1016	146.2
	18	41 1 11.6	5 26.38	23.9	1 6 59.8	3.88	0.697 1605	148.1
	22	41 22 56.9	5 26.29	24.0	1 6 44.2	3.93	0.697 2201	149.8
Mar.	26	41 44 41.9	5 26.20	24.2	1 6 28.4	3.97	0.697 2804	151.6
	2	42 6 26.5	5 26.10	-24.4	-1 6 12.4	+4.01	0.697 3414	+153.3
	6	42 28 10.7	5 26.00	24.5	1 5 56.3	4.04	0.697 4030	155.0
	10	42 49 54.5	5 25.91	24.6	1 5 40.1	4.08	0.697 4654	156.7
	14	43 11 38.0	5 25.81	24.8	1 5 23.7	4.12	0.697 5284	158.4
	18	43 33 21.0	5 25.71	24.9	1 5 7.1	4.16	0.697 5921	160.1
	22	43 55 3.7	5 25.62	-25.0	-1 4 50.4	+4.19	0.697 6565	+161.9
Apr.	26	44 16 46.0	5 25.52	25.1	1 4 33.6	4.23	0.697 7216	163.5
	30	44 38 27.9	5 25.42	25.3	1 4 16.6	4.26	0.697 7873	165.1
	3	45 0 9.4	5 25.32	25.4	1 3 59.5	4.30	0.697 8537	166.9
	7	45 21 50.5	5 25.22	25.5	1 3 42.2	4.35	0.697 9208	168.5
	11	45 43 31.2	5 25.11	-25.6	-1 3 24.7	+4.39	0.697 9885	+170.0
	15	46 5 11.4	5 25.01	25.7	1 3 7.1	4.41	0.698 0568	171.7
	19	46 26 51.3	5 24.91	25.8	1 2 49.4	4.45	0.698 1259	173.4
May	23	46 48 30.7	5 24.81	25.9	1 2 31.5	4.49	0.698 1955	175.0
	27	47 10 9.8	5 24.70	26.0	1 2 13.5	4.52	0.698 2659	176.7
	1	47 31 48.3	5 24.59	-26.0	-1 1 55.3	+4.56	0.698 3369	+178.3
	5	47 53 26.5	5 24.49	26.1	1 1 37.0	4.59	0.698 4085	179.8
	9	48 15 4.2	5 24.38	26.2	1 1 18.6	4.62	0.698 4807	181.4
	13	48 36 41.5	5 24.28	26.3	1 1 0.0	4.66	0.698 5536	183.0
	17	48 58 18.4	5 24.16	26.4	1 0 41.3	4.70	0.698 6271	184.6
June	21	49 19 54.8	5 24.04	-26.4	-1 0 22.4	+4.74	0.698 7013	+186.2
	25	49 41 30.7	5 23.93	26.5	1 0 3.4	4.76	0.698 7761	187.8
	29	50 3 6.2	5 23.82	26.5	0 59 44.3	4.80	0.698 8515	189.3
	2	50 24 41.3	5 23.71	26.6	0 59 25.0	4.84	0.698 9275	190.8
	6	50 46 15.9	5 23.59	26.6	0 59 5.6	4.86	0.699 0041	192.3
	10	51 7 50.0	5 23.46	-26.7	-0 58 46.1	+4.89	0.699 0813	+193.9
	14	51 29 23.6	5 23.35	26.7	0 58 26.5	4.92	0.699 1592	195.4
July	18	51 50 56.8	5 23.24	26.8	0 58 6.7	4.96	0.699 2376	196.8
	22	52 12 29.5	5 23.12	26.8	0 57 46.8	5.00	0.699 3166	198.4
	26	52 34 1.8	5 23.00	26.8	0 57 26.7	5.04	0.699 3963	199.9
	30	52 55 33.5	5 22.88	-26.8	-0 57 6.5	+5.06	0.699 4765	+201.3
	4	53 17 4.8	5 22.76	-26.8	-0 56 46.2	+5.09	0.699 5573	+202.7

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
July	4	53 17 4.8	5 22.76	-26.8	-0 56 46.2	+5.09	0.699 5573	+202.7
	8	53 38 35.6	5 22.64	26.8	0 56 25.8	5.12	0.699 6387	204.2
	12	54 0 5.9	5 22.51	26.8	0 56 5.2	5.16	0.699 7207	206.6
	16	54 21 35.7	5 22.39	26.9	0 55 44.5	5.19	0.699 8032	207.0
	20	54 43 5.0	5 22.26	26.9	0 55 23.7	5.21	0.699 8863	208.5
	24	55 4 33.8	5 22.14	-26.9	-0 55 2.8	+5.24	0.699 9700	+210.0
	28	55 26 2.1	5 22.01	26.8	0 54 41.8	5.27	0.700 0543	211.5
Aug.	1	55 47 29.9	5 21.89	26.8	0 54 20.6	5.30	0.700 1392	212.9
	5	56 8 57.2	5 21.76	26.8	0 53 59.4	5.33	0.700 2246	214.1
	9	56 30 24.0	5 21.64	26.8	0 53 38.0	5.37	0.700 3105	215.5
	13	56 51 50.3	5 21.50	-26.8	-0 53 16.4	+5.40	0.700 3970	+217.0
	17	57 13 16.0	5 21.36	26.8	0 52 54.8	5.42	0.700 4841	218.4
	21	57 34 41.2	5 21.24	26.7	0 52 33.1	5.45	0.700 5717	219.7
	25	57 56 6.0	5 21.11	26.7	0 52 11.2	5.48	0.700 6599	221.0
	29	58 17 30.1	5 20.98	26.6	0 51 49.2	5.50	0.700 7485	222.4
Sept.	2	58 38 53.8	5 20.85	-26.6	-0 51 27.2	+5.53	0.700 8378	+223.7
	6	59 0 16.9	5 20.71	26.6	0 51 5.0	5.56	0.700 9275	225.0
	10	59 21 39.5	5 20.58	26.5	0 50 42.7	5.59	0.701 0178	226.4
	14	59 43 1.5	5 20.45	26.4	0 50 20.3	5.62	0.701 1086	227.6
	18	60 4 23.1	5 20.31	26.4	0 49 57.7	5.65	0.701 1999	228.9
	22	60 25 44.0	5 20.17	-26.3	-0 49 35.1	+5.67	0.701 2917	+230.1
	26	60 47 4.4	5 20.04	26.2	0 49 12.4	5.70	0.701 3840	231.5
	30	61 8 24.3	5 19.90	26.2	0 48 49.5	5.72	0.701 4769	232.7
Oct.	4	61 29 43.6	5 19.76	26.1	0 48 26.6	5.75	0.701 5702	233.9
	8	61 51 2.4	5 19.62	26.0	0 48 3.5	5.77	0.701 6640	235.0
	12	62 12 20.6	5 19.48	-25.9	-0 47 40.4	+5.79	0.701 7582	+236.2
	16	62 33 38.2	5 19.34	25.8	0 47 17.2	5.81	0.701 8530	237.6
	20	62 54 55.3	5 19.20	25.8	0 46 53.9	5.85	0.701 9483	238.8
	24	63 16 11.8	5 19.06	25.7	0 46 30.4	5.87	0.702 0440	239.9
	28	63 37 27.8	5 18.92	25.6	0 46 6.9	5.89	0.702 1402	241.0
Nov.	1	63 58 43.2	5 18.78	-25.4	-0 45 43.3	+5.92	0.702 2368	+242.2
	5	64 19 58.0	5 18.63	25.3	0 45 19.5	5.94	0.702 3340	243.4
	9	64 41 12.2	5 18.49	25.2	0 44 55.7	5.96	0.702 4315	244.5
	13	65 2 25.9	5 18.35	25.1	0 44 31.8	5.99	0.702 5296	245.7
	17	65 23 39.0	5 18.20	25.0	0 44 7.8	6.01	0.702 6281	246.8
	21	65 44 51.5	5 18.05	-24.9	-0 43 43.7	+6.03	0.702 7270	+247.9
	25	66 6 3.4	5 17.90	24.7	0 43 19.6	6.05	0.702 8264	249.0
	29	66 27 14.7	5 17.76	24.6	0 42 55.3	6.07	0.702 9262	250.1
Dec.	3	66 48 25.5	5 17.61	24.5	0 42 31.0	6.09	0.703 0265	251.2
	7	67 9 35.6	5 17.46	24.3	0 42 6.6	6.12	0.703 1272	252.3
	11	67 30 45.2	5 17.32	-24.2	-0 41 42.0	+6.15	0.703 2283	+253.3
	15	67 51 54.2	5 17.17	24.0	0 41 17.4	6.17	0.703 3298	254.3
	19	68 13 2.6	5 17.01	23.9	0 40 52.7	6.19	0.703 4317	255.4
	23	68 34 10.3	5 16.86	23.7	0 40 27.9	6.20	0.703 5341	256.5
	27	68 55 17.5	5 16.72	23.6	0 40 3.1	6.22	0.703 6369	257.4
	31	69 16 24.1	5 16.56	-23.4	-0 39 38.2	+6.24	0.703 7400	+258.4
	35	69 37 30.0	5 16.41	-23.3	-0 39 13.2	+6.26	0.703 8436	+259.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Paralax.	Transit. Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Jan.	1	8	2 25.24	-0.792	+20	38	59.3	+2.59	0.909 5168	-112.3	9.54	1.09	13 17.8
	2	8	2 6.13	0.800	20	40	1.7	2.61	0.909 2552	106.6	9.55	1.09	13 13.5
	3	8	1 46.84	0.808	20	41	4.5	2.62	0.909 0098	98.9	9.55	1.09	13 9.3
	4	8	1 27.37	0.814	20	42	7.6	2.64	0.908 7806	92.1	9.56	1.09	13 5.0
	5	8	1 7.75	0.821	20	43	11.0	2.65	0.908 5677	85.3	9.56	1.09	13 0.8
	6	8	0 47.98	-0.827	+20	44	14.6	+2.66	0.908 3713	-78.4	9.57	1.09	12 56.5
	7	8	0 28.06	0.833	20	45	18.5	2.67	0.908 1915	71.5	9.57	1.09	12 52.3
	8	8	0 8.02	0.837	20	46	22.6	2.67	0.908 0283	64.5	9.57	1.09	12 48.0
	9	7	59 47.87	0.842	20	47	26.8	2.68	0.907 8819	57.5	9.58	1.09	12 43.7
	10	7	59 27.61	0.846	20	48	31.1	2.68	0.907 7521	50.6	9.58	1.09	12 39.5
	11	7	59 7.26	-0.850	+20	49	35.5	+2.69	0.907 6392	-43.5	9.58	1.09	12 35.2
	12	7	58 46.82	0.853	20	50	40.0	2.69	0.907 5431	36.5	9.58	1.09	12 30.9
	13	7	58 26.31	0.856	20	51	44.5	2.69	0.907 4640	29.4	9.59	1.09	12 26.7
	14	7	58 5.74	0.858	20	52	49.0	2.69	0.907 4018	22.4	9.59	1.09	12 22.4
	15	7	57 45.12	0.860	20	53	53.4	2.68	0.907 3566	15.2	9.59	1.09	12 18.1
	16	7	57 24.47	-0.861	+20	54	57.7	+2.68	0.907 3286	-8.1	9.59	1.09	12 13.8
	17	7	57 3.80	0.862	20	56	1.9	2.67	0.907 3178	-0.9	9.59	1.09	12 9.5
	18	7	56 43.11	0.862	20	57	5.9	2.67	0.907 3242	+6.3	9.59	1.09	12 5.3
	19	7	56 22.43	0.862	20	58	9.7	2.65	0.907 3479	13.5	9.59	1.09	12 1.0
	20	7	56 1.75	0.861	20	59	13.3	2.64	0.907 3888	20.6	9.59	1.09	11 56.7
	21	7	55 41.11	-0.859	+21	0	16.7	+2.63	0.907 4468	+27.7	9.59	1.09	11 52.5
	22	7	55 20.50	0.858	21	1	19.7	2.62	0.907 5219	34.8	9.58	1.09	11 48.2
	23	7	54 59.94	0.856	21	2	22.4	2.61	0.907 6141	42.0	9.58	1.09	11 43.9
	24	7	54 39.44	0.853	21	3	24.8	2.59	0.907 7234	49.1	9.58	1.09	11 39.7
	25	7	54 19.02	0.849	21	4	26.7	2.57	0.907 8496	56.1	9.58	1.09	11 35.4
	26	7	53 58.69	-0.845	+21	5	28.2	+2.55	0.907 9928	+63.2	9.57	1.09	11 31.1
	27	7	53 38.46	0.840	21	6	29.2	2.53	0.908 1528	70.2	9.57	1.09	11 26.8
	28	7	53 18.35	0.836	21	7	29.7	2.51	0.908 3296	77.1	9.57	1.09	11 22.6
	29	7	52 58.36	0.830	21	8	29.6	2.48	0.908 5229	84.0	9.56	1.09	11 18.3
	30	7	52 38.51	0.824	21	9	28.9	2.46	0.908 7328	90.9	9.56	1.09	11 14.1
Feb.	31	7	52 18.81	-0.818	+21	10	27.7	+2.44	0.908 9590	+97.6	9.55	1.09	11 9.8
	1	7	51 59.26	0.811	21	11	25.9	2.41	0.909 2014	104.3	9.55	1.08	11 5.5
	2	7	51 39.89	0.803	21	12	23.4	2.38	0.909 4598	111.0	9.54	1.08	11 1.3
	3	7	51 20.70	0.796	21	13	20.3	2.36	0.909 7340	117.5	9.54	1.08	10 57.0
	4	7	51 1.70	0.788	21	14	16.5	2.33	0.910 0240	124.1	9.53	1.08	10 52.8
	5	7	50 42.90	-0.779	+21	15	12.0	+2.30	0.910 3296	+130.6	9.52	1.08	10 48.6
	6	7	50 24.31	0.770	21	16	6.7	2.26	0.910 6507	137.0	9.52	1.08	10 44.3
	7	7	50 5.94	0.760	21	17	0.7	2.23	0.910 9872	143.3	9.51	1.08	10 40.1
	8	7	49 47.81	0.750	21	17	53.8	2.20	0.911 3387	149.6	9.50	1.08	10 35.8
	9	7	49 29.92	0.740	21	18	46.2	2.17	0.911 7053	155.8	9.49	1.08	10 31.6
	10	7	49 12.27	-0.730	+21	19	37.8	+2.13	0.912 0866	+161.9	9.48	1.08	10 27.4
	11	7	48 54.89	0.719	21	20	28.6	2.10	0.912 4825	167.9	9.48	1.08	10 23.2
	12	7	48 37.77	0.707	21	21	18.5	2.06	0.912 8927	173.9	9.47	1.08	10 19.0
	13	7	48 20.94	0.695	21	22	7.5	2.02	0.913 3172	179.8	9.46	1.07	10 14.8
	14	7	48 4.39	0.683	21	22	55.7	1.99	0.913 7557	185.6	9.45	1.07	10 10.6
	15	7	47 48.14	-0.671	+21	23	42.9	+1.95	0.914 2081	+191.3	9.44	1.07	10 6.4
	16	7	47 32.20	-0.658	+21	24	29.2	+1.91	0.914 6740	+196.9	9.43	1.07	10 2.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Hours.	Minutes.	Seconds.		Hours.	Minutes.	Seconds.							
	h	m	s	s	°	'	"	"					h	m
Feb. 16	7	47	32.20	-0.658	+21	24	29.2	+1.91	0.914 6740	+196.9	9.43	1.07	10	2.2
17	7	47	16.57	0.644	21	25	14.6	1.87	0.915 1534	202.5	9.42	1.07	9	58.0
18	7	47	1.27	0.631	21	25	59.0	1.83	0.915 6459	207.9	9.41	1.07	9	53.8
19	7	46	46.30	0.617	21	26	42.4	1.79	0.916 1514	213.3	9.40	1.07	9	49.6
20	7	46	31.68	0.602	21	27	24.8	1.75	0.916 6697	218.5	9.38	1.07	9	45.4
21	7	46	17.40	-0.588	+21	28	6.2	+1.70	0.917 2004	+223.7	9.37	1.06	9	41.3
22	7	46	3.48	0.572	21	28	46.6	1.66	0.917 7433	228.7	9.36	1.06	9	37.1
23	7	45	49.93	0.557	21	29	26.0	1.62	0.918 2981	233.6	9.35	1.06	9	33.0
24	7	45	36.75	0.541	21	30	4.3	1.57	0.918 8646	238.4	9.34	1.06	9	28.8
25	7	45	23.95	0.525	21	30	41.5	1.53	0.919 4425	243.1	9.32	1.06	9	24.7
26	7	45	11.54	-0.509	+21	31	17.7	+1.48	0.920 0315	+247.6	9.31	1.06	9	20.5
27	7	44	59.52	0.492	21	31	52.7	1.44	0.920 6312	252.1	9.30	1.06	9	16.4
28	7	44	47.91	0.476	21	32	26.7	1.39	0.921 2415	256.4	9.29	1.05	9	12.3
Mar. 1	7	44	36.69	0.459	21	32	59.5	1.34	0.921 8619	260.6	9.27	1.05	9	8.2
2	7	44	25.88	0.442	21	33	31.2	1.30	0.922 4923	264.7	9.26	1.05	9	4.1
3	7	44	15.49	-0.424	+21	34	1.8	+1.25	0.923 1324	+268.7	9.25	1.05	9	0.0
4	7	44	5.51	0.407	21	34	31.3	1.21	0.923 7820	272.5	9.23	1.05	8	55.9
5	7	43	55.96	0.389	21	34	59.7	1.16	0.924 4406	276.3	9.22	1.05	8	51.8
6	7	43	46.84	0.371	21	35	27.0	1.11	0.925 1081	279.9	9.20	1.05	8	47.7
7	7	43	38.15	0.353	21	35	53.1	1.06	0.925 7841	283.4	9.19	1.04	8	43.6
8	7	43	29.89	-0.335	+21	36	18.1	+1.02	0.926 4683	+286.8	9.18	1.04	8	39.6
9	7	43	22.07	0.317	21	36	42.0	0.97	0.927 1605	290.0	9.16	1.04	8	35.5
10	7	43	14.69	0.298	21	37	4.8	0.92	0.927 8605	293.2	9.15	1.04	8	31.4
11	7	43	7.75	0.280	21	37	26.4	0.88	0.928 5680	296.3	9.13	1.04	8	27.4
12	7	43	1.26	0.261	21	37	46.8	0.83	0.929 2826	299.2	9.12	1.04	8	23.4
13	7	42	55.22	-0.242	+21	38	6.1	+0.78	0.930 0043	+302.1	9.10	1.03	8	19.3
14	7	42	49.64	0.223	21	38	24.3	0.73	0.930 7326	304.8	9.09	1.03	8	15.3
15	7	42	44.51	0.204	21	38	41.3	0.68	0.931 4673	307.4	9.07	1.03	8	11.3
16	7	42	39.83	0.185	21	38	57.1	0.64	0.932 2081	309.9	9.05	1.03	8	7.3
17	7	42	35.62	0.166	21	39	11.8	0.59	0.932 9549	312.3	9.04	1.03	8	3.3
18	7	42	31.87	-0.147	+21	39	25.3	+0.54	0.933 7072	+314.6	9.02	1.03	7	59.3
19	7	42	28.58	0.128	21	39	37.6	0.49	0.934 4649	316.8	9.01	1.02	7	55.3
20	7	42	25.76	0.108	21	39	48.8	0.44	0.935 2276	318.8	8.99	1.02	7	51.4
21	7	42	23.41	0.088	21	39	58.8	0.39	0.935 9951	320.7	8.98	1.02	7	47.4
22	7	42	21.53	0.068	21	40	7.6	0.34	0.936 7671	322.5	8.96	1.02	7	43.4
23	7	42	20.13	-0.049	+21	40	15.2	+0.29	0.937 5433	+324.2	8.94	1.02	7	39.5
24	7	42	19.19	0.029	21	40	21.7	0.24	0.938 3234	325.8	8.93	1.01	7	35.5
25	7	42	18.73	-0.010	21	40	26.9	0.19	0.939 1071	327.2	8.91	1.01	7	31.6
26	7	42	18.74	+0.010	21	40	31.0	0.15	0.939 8941	328.6	8.90	1.01	7	27.6
27	7	42	19.22	0.030	21	40	33.9	0.10	0.940 6842	329.8	8.88	1.01	7	23.7
28	7	42	20.18	+0.049	+21	40	35.6	+0.05	0.941 4770	+330.8	8.86	1.01	7	19.8
29	7	42	21.60	0.069	21	40	36.1	0.00	0.942 2723	331.8	8.85	1.01	7	15.9
30	7	42	23.50	0.089	21	40	35.5	-0.05	0.943 0697	332.7	8.83	1.00	7	12.0
31	7	42	25.87	0.109	21	40	33.7	0.10	0.943 8691	333.4	8.82	1.00	7	8.1
Apr. 1	7	42	28.70	0.128	21	40	30.7	0.15	0.944 6702	334.1	8.80	1.00	7	4.3
2	7	42	32.00	+0.147	+21	40	26.6	-0.20	0.945 4727	+334.6	8.78	1.00	7	0.4
3	7	42	35.77	+0.167	+21	40	21.3	-0.24	0.946 2764	+335.1	8.77	1.00	6	56.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	° ' "	"			"	"	h m
Apr.	1	7 42	28.70	+0.128	+21 40 30.7	-0.15	0.944 6702	+334.1	8.80	1.00	7 4.3
	2	7 42	32.00	0.147	21 40 26.6	0.20	0.945 4727	334.6	8.78	1.00	7 0.4
	3	7 42	35.77	0.167	21 40 21.3	0.24	0.946 2764	335.1	8.77	1.00	6 56.5
	4	7 42	40.00	0.186	21 40 14.9	0.29	0.947 0811	335.4	8.75	0.99	6 52.6
	5	7 42	44.69	0.205	21 40 7.3	0.34	0.947 8866	335.7	8.73	0.99	6 48.8
	6	7 42	49.84	+0.224	+21 39 58.5	-0.39	0.948 6925	+335.8	8.72	0.99	6 44.9
	7	7 42	55.44	0.243	21 39 48.6	0.44	0.949 4987	335.9	8.70	0.99	6 41.1
	8	7 43	1.50	0.262	21 39 37.6	0.48	0.950 3050	335.9	8.68	0.99	6 37.3
	9	7 43	8.01	0.281	21 39 25.4	0.53	0.951 1111	335.8	8.67	0.98	6 33.5
	10	7 43	14.97	0.299	21 39 12.1	0.58	0.951 9169	335.6	8.65	0.98	6 29.6
	11	7 43	22.38	+0.318	+21 38 57.6	-0.62	0.952 7221	+335.4	8.64	0.98	6 25.8
	12	7 43	30.23	0.337	21 38 42.1	0.67	0.953 5266	335.0	8.62	0.98	6 22.0
	13	7 43	38.53	0.355	21 38 25.4	0.72	0.954 3301	334.6	8.60	0.98	6 18.2
	14	7 43	47.28	0.374	21 38 7.6	0.76	0.955 1325	334.0	8.59	0.98	6 14.5
	15	7 43	56.46	0.392	21 37 48.7	0.81	0.955 9334	333.4	8.57	0.97	6 10.7
	16	7 44	6.09	+0.410	+21 37 28.6	-0.86	0.956 7328	+332.7	8.56	0.97	6 6.9
	17	7 44	16.15	0.428	21 37 7.4	0.91	0.957 5308	331.9	8.54	0.97	6 3.1
	18	7 44	26.64	0.446	21 36 45.0	0.96	0.958 3257	331.0	8.53	0.97	5 59.4
	19	7 44	37.56	0.464	21 36 21.5	1.00	0.959 1189	330.0	8.51	0.97	5 55.6
	20	7 44	48.91	0.482	21 35 56.9	1.05	0.959 9096	328.9	8.49	0.97	5 51.9
	21	7 45	0.68	+0.499	+21 35 31.1	-1.10	0.960 6977	+327.8	8.48	0.96	5 48.2
	22	7 45	12.88	0.517	21 35 4.3	1.14	0.961 4829	326.5	8.47	0.96	5 44.4
	23	7 45	25.49	0.534	21 34 36.3	1.19	0.962 2649	325.2	8.45	0.96	5 40.7
	24	7 45	38.52	0.551	21 34 7.2	1.23	0.963 0437	323.8	8.43	0.96	5 37.0
	25	7 45	51.96	0.568	21 33 37.1	1.28	0.963 8190	322.3	8.42	0.96	5 33.3
	26	7 46	5.80	+0.585	+21 33 5.8	-1.33	0.964 5906	+320.7	8.40	0.95	5 29.6
	27	7 46	20.04	0.602	21 32 33.4	1.37	0.965 3583	319.0	8.39	0.95	5 25.9
	28	7 46	34.68	0.618	21 31 59.9	1.42	0.966 1220	317.4	8.37	0.95	5 22.2
	29	7 46	49.72	0.635	21 31 25.3	1.46	0.966 8816	315.6	8.36	0.95	5 18.5
	30	7 47	5.14	0.650	21 30 49.7	1.51	0.967 6368	313.7	8.35	0.95	5 14.9
May	1	7 47	20.94	+0.667	+21 30 13.0	-1.55	0.968 3875	+311.8	8.33	0.95	5 11.2
	2	7 47	37.13	0.682	21 29 35.2	1.60	0.969 1335	309.8	8.32	0.94	5 7.5
	3	7 47	53.69	0.698	21 28 56.4	1.64	0.969 8747	307.8	8.30	0.94	5 3.9
	4	7 48	10.62	0.713	21 28 16.5	1.68	0.970 6109	305.7	8.29	0.94	5 0.2
	5	7 48	27.91	0.728	21 27 35.6	1.73	0.971 3421	303.6	8.27	0.94	4 56.6
	6	7 48	45.57	+0.743	+21 26 53.6	-1.77	0.972 0681	+301.4	8.26	0.94	4 52.9
	7	7 49	3.59	0.758	21 26 10.6	1.81	0.972 7888	299.1	8.25	0.94	4 49.3
	8	7 49	21.96	0.773	21 25 26.5	1.86	0.973 5039	296.8	8.23	0.94	4 45.7
	9	7 49	40.67	0.787	21 24 41.4	1.90	0.974 2134	294.4	8.22	0.93	4 42.1
	10	7 49	59.74	0.802	21 23 55.3	1.94	0.974 9172	292.0	8.21	0.93	4 38.5
	11	7 50	19.14	+0.816	+21 23 8.1	-1.99	0.975 6151	+289.6	8.19	0.93	4 34.8
	12	7 50	38.89	0.830	21 22 19.9	2.03	0.976 3071	287.0	8.18	0.93	4 31.2
	13	7 50	58.96	0.843	21 21 30.6	2.07	0.976 9929	284.5	8.17	0.93	4 27.6
	14	7 51	19.37	0.857	21 20 40.3	2.12	0.977 6726	281.9	8.16	0.93	4 24.0
	15	7 51	40.10	0.871	21 19 49.0	2.16	0.978 3459	279.2	8.14	0.92	4 20.4
	16	7 52	1.16	+0.884	+21 18 56.7	-2.20	0.979 0128	+276.5	8.13	0.92	4 16.9
	17	7 52	22.53	+0.897	+21 18 3.4	-2.24	0.979 6730	+273.7	8.12	0.92	4 13.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
May 17	7	52	22.53	+0.997	+21	18	3.4	-2.24	0.979 6790	+273.7	8.12	0.92	4 13.3
18	7	52	44.22	0.910	21	17	9.1	2.28	0.980 3264	270.8	8.10	0.92	4 9.7
19	7	53	6.21	0.923	21	16	13.7	2.33	0.980 9730	267.9	8.09	0.92	4 6.1
20	7	53	28.51	0.935	21	15	17.4	2.37	0.981 6125	265.0	8.08	0.92	4 2.6
21	7	53	51.11	0.948	21	14	20.0	2.41	0.982 2448	262.0	8.07	0.92	3 59.0
22	7	54	14.01	+0.960	+21	13	21.6	-2.45	0.982 8699	+258.9	8.06	0.92	3 55.5
23	7	54	37.19	0.972	21	12	22.3	2.49	0.983 4877	255.9	8.06	0.91	3 52.0
24	7	55	0.66	0.984	21	11	22.0	2.53	0.984 0981	252.7	8.04	0.91	3 48.4
25	7	55	24.41	0.995	21	10	20.7	2.57	0.984 7008	249.5	8.02	0.91	3 44.9
26	7	55	48.43	1.007	21	9	18.5	2.61	0.985 2959	246.4	8.01	0.91	3 41.3
27	7	56	12.72	+1.018	+21	8	15.3	-2.65	0.985 8833	+243.1	8.00	0.91	3 37.8
28	7	56	37.28	1.029	21	7	11.2	2.69	0.986 4629	239.3	7.99	0.91	3 34.3
29	7	57	2.09	1.039	21	6	6.1	2.73	0.987 0345	235.5	7.98	0.91	3 30.8
30	7	57	27.16	1.050	21	5	0.1	2.77	0.987 5980	231.1	7.97	0.91	3 27.2
31	7	57	52.48	1.060	21	3	53.1	2.81	0.988 1534	226.7	7.96	0.90	3 23.7
June 1	7	58	18.04	+1.070	+21	2	45.3	-2.84	0.988 7006	+223.3	7.95	0.90	3 20.2
2	7	58	43.84	1.080	21	1	36.6	2.88	0.989 2396	222.9	7.94	0.90	3 16.7
3	7	59	9.88	1.090	21	0	27.0	2.92	0.989 7703	219.4	7.93	0.90	3 13.2
4	7	59	36.14	1.099	20	59	16.4	2.96	0.990 2926	215.9	7.92	0.90	3 9.7
5	8	0	2.63	1.108	20	58	5.0	2.99	0.990 8066	212.4	7.91	0.90	3 6.2
6	8	0	29.34	+1.117	+20	56	52.7	-3.03	0.991 3122	+208.9	7.90	0.90	3 2.7
7	8	0	56.27	1.126	20	55	39.5	3.07	0.991 8093	205.3	7.89	0.90	2 59.3
8	8	1	23.41	1.135	20	54	25.5	3.10	0.992 2978	201.8	7.89	0.90	2 55.8
9	8	1	50.77	1.144	20	53	10.5	3.14	0.992 7777	198.1	7.88	0.89	2 52.3
10	8	2	18.32	1.152	20	51	54.7	3.18	0.993 2489	194.5	7.87	0.89	2 48.8
11	8	2	46.08	+1.161	+20	50	38.0	-3.21	0.993 7112	+190.3	7.86	0.89	2 45.4
12	8	3	14.03	1.169	20	49	20.5	3.25	0.994 1647	187.1	7.85	0.89	2 41.9
13	8	3	42.17	1.177	20	48	2.1	3.28	0.994 6093	183.4	7.84	0.89	2 38.4
14	8	4	10.50	1.184	20	46	42.9	3.32	0.995 0448	179.6	7.83	0.89	2 35.0
15	8	4	39.02	1.192	20	45	22.8	3.35	0.995 4713	175.8	7.83	0.89	2 31.5
16	8	5	7.71	+1.199	+20	44	2.0	-3.38	0.995 8887	+172.0	7.82	0.89	2 28.0
17	8	5	36.58	1.207	20	42	40.3	3.42	0.996 2968	168.1	7.81	0.89	2 24.6
18	8	6	5.62	1.213	20	41	17.8	3.45	0.996 6955	164.2	7.80	0.89	2 21.1
19	8	6	34.82	1.220	20	39	54.5	3.49	0.997 0849	160.3	7.80	0.89	2 17.7
20	8	7	4.18	1.227	20	38	30.4	3.52	0.997 4649	156.4	7.79	0.89	2 14.3
21	8	7	33.70	+1.233	+20	37	5.5	-3.55	0.997 8355	+152.4	7.78	0.88	2 10.8
22	8	8	3.37	1.239	20	35	39.9	3.58	0.998 1965	148.5	7.78	0.88	2 7.4
23	8	8	33.18	1.245	20	34	13.5	3.61	0.998 5481	144.5	7.77	0.88	2 3.9
24	8	9	3.13	1.251	20	32	46.4	3.65	0.998 8901	140.5	7.77	0.88	2 0.5
25	8	9	33.22	1.256	20	31	18.5	3.68	0.999 2224	136.5	7.76	0.88	1 57.1
26	8	10	3.43	+1.261	+20	29	50.0	-3.70	0.999 5451	+132.4	7.75	0.88	1 53.6
27	8	10	33.77	1.267	20	28	20.7	3.74	0.999 8580	128.4	7.75	0.88	1 50.2
28	8	11	4.23	1.272	20	26	50.7	3.77	1.000 1612	124.3	7.74	0.88	1 46.8
29	8	11	34.80	1.276	20	25	20.1	3.79	1.000 4547	120.3	7.74	0.88	1 43.4
30	8	12	5.48	1.281	20	23	48.8	3.82	1.000 7384	116.2	7.73	0.88	1 39.9
July 1	8	12	36.27	+1.285	+20	22	16.8	-3.85	1.001 0123	+112.1	7.73	0.88	1 36.5
2	8	13	7.17	+1.289	+20	20	44.1	-3.88	1.001 2764	+108.0	7.72	0.88	1 33.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.
July	1	8 12 36.27	+1.285	+20 22 16.8	-3.85	1.001 0123	+112.1	7.73	0.88	1 36.5			
	2	8 13 7.17	1.289	20 20 44.1	3.88	1.001 2764	108.0	7.72	0.88	1 33.1			
	3	8 13 38.16	1.293	20 19 10.8	3.90	1.001 5307	103.9	7.72	0.88	1 29.7			
	4	8 14 9.24	1.297	20 17 36.9	3.92	1.001 7752	99.8	7.71	0.88	1 26.3			
	5	8 14 40.42	1.301	20 16 2.4	3.95	1.002 0099	95.7	7.71	0.87	1 22.8			
	6	8 15 11.68	+1.304	+20 14 27.2	-3.98	1.002 2346	+ 91.6	7.71	0.87	1 19.4			
	7	8 15 43.02	1.307	20 12 51.5	4.00	1.002 4495	87.5	7.70	0.87	1 16.0			
	8	8 16 14.43	1.310	20 11 15.1	4.03	1.002 6544	83.3	7.70	0.87	1 12.6			
	9	8 16 45.92	1.314	20 9 38.1	4.05	1.002 8493	79.1	7.70	0.87	1 9.2			
	10	8 17 17.49	1.317	20 8 0.6	4.08	1.003 0342	75.0	7.69	0.87	1 5.8			
	11	8 17 49.12	+1.319	+20 6 22.5	-4.10	1.003 2091	+ 70.8	7.69	0.87	1 2.4			
	12	8 18 20.80	1.321	20 4 43.8	4.12	1.003 3739	66.6	7.69	0.87	0 59.0			
	13	8 18 52.55	1.324	20 3 4.6	4.14	1.003 5286	62.4	7.68	0.87	0 55.6			
	14	8 19 24.35	1.326	20 1 24.9	4.17	1.003 6732	58.1	7.68	0.87	0 52.2			
	15	8 19 56.21	1.328	19 59 44.6	4.19	1.003 8077	53.9	7.68	0.87	0 48.8			
	16	8 20 28.10	+1.330	+19 58 3.9	-4.21	1.003 9319	+ 49.6	7.68	0.87	0 45.4			
	17	8 21 0.04	1.331	19 56 22.7	4.23	1.004 0459	45.4	7.67	0.87	0 42.0			
	18	8 21 32.01	1.333	19 54 41.0	4.25	1.004 1496	41.1	7.67	0.87	0 38.6			
	19	8 22 4.01	1.334	19 52 58.9	4.26	1.004 2431	36.8	7.67	0.87	0 35.2			
	20	8 22 36.03	1.335	19 51 16.3	4.28	1.004 3262	32.5	7.67	0.87	0 31.8			
	21	8 23 8.07	+1.335	+19 49 33.3	-4.30	1.004 3989	+ 28.2	7.67	0.87	0 28.3			
	22	8 23 40.13	1.336	19 47 49.9	4.32	1.004 4613	23.9	7.67	0.87	0 24.9			
	23	8 24 12.21	1.336	19 46 6.1	4.33	1.004 5134	19.6	7.67	0.87	0 21.5			
	24	8 24 44.28	1.336	19 44 22.0	4.35	1.004 5552	15.3	7.67	0.87	0 18.2			
	25	8 25 16.36	1.336	19 42 37.5	4.36	1.004 5868	11.0	7.67	0.87	0 14.8			
	26	8 25 48.43	+1.336	+19 40 52.6	-4.38	1.004 6082	+ 6.8	7.66	0.87	0 11.4			
	27	8 26 20.50	1.336	19 39 7.5	4.39	1.004 6194	+ 2.5	7.66	0.87	0 7.9			
	28	8 26 52.55	1.336	19 37 22.0	4.40	1.004 6203	- 1.8	7.66	0.87	0 4.5			
	29	8 27 24.59	1.335	19 35 36.2	4.41	1.004 6109	6.1	7.66	0.87	0 1.1			
	30	8 27 56.61	1.334	19 33 50.1	4.43	1.004 5912	10.3	7.67	0.87	23 57.7			
	31	8 28 28.61	+1.333	+19 32 3.8	-4.44	1.004 5613	- 14.6	7.67	0.87	23 54.3			
Aug.	1	8 29 0.58	1.331	19 30 17.2	4.45	1.004 5211	18.9	7.67	0.87	23 50.9			
	2	8 29 32.51	1.330	19 28 30.4	4.46	1.004 4707	23.1	7.67	0.87	23 47.5			
	3	8 30 4.41	1.328	19 26 43.3	4.46	1.004 4102	27.4	7.67	0.87	23 44.1			
	4	8 30 36.27	1.327	19 24 56.1	4.47	1.004 3394	31.6	7.67	0.87	23 40.7			
	5	8 31 8.09	+1.325	+19 23 8.7	-4.48	1.004 2584	- 35.9	7.67	0.87	23 37.3			
	6	8 31 39.86	1.323	19 21 21.1	4.49	1.004 1672	40.1	7.67	0.87	23 33.9			
	7	8 32 11.59	1.321	19 19 33.4	4.49	1.004 0658	44.4	7.67	0.87	23 30.5			
	8	8 32 43.25	1.318	19 17 45.5	4.50	1.003 9542	48.6	7.68	0.87	23 27.1			
	9	8 33 14.86	1.316	19 15 57.5	4.50	1.003 8324	52.9	7.68	0.87	23 23.7			
	10	8 33 46.41	+1.313	+19 14 9.4	-4.51	1.003 7003	- 57.2	7.68	0.87	23 20.3			
	11	8 34 17.89	1.310	19 12 21.2	4.51	1.003 5579	61.4	7.68	0.87	23 16.9			
	12	8 34 49.29	1.307	19 10 32.9	4.51	1.003 4054	65.7	7.68	0.87	23 13.5			
	13	8 35 20.62	1.304	19 8 44.6	4.51	1.003 2427	69.9	7.69	0.87	23 10.0			
	14	8 35 51.87	1.300	19 6 56.2	4.51	1.003 0698	74.2	7.69	0.87	23 6.6			
	15	8 36 23.03	+1.297	+19 5 7.9	-4.51	1.002 8867	- 78.4	7.70	0.87	23 3.2			
	16	8 36 54.10	+1.293	+19 3 19.5	-4.51	1.002 6935	- 82.6	7.70	0.87	22 59.8			

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Aug. 16	8	36	54.10	+1.203	+19	3	19.5	-4.51	1.002 6935	- 82.6	7.70	0.87	22 56.4
17	8	37	25.07	1.200	19	1	31.3	4.51	1.002 4900	86.9	7.70	0.87	22 53.0
18	8	37	55.95	1.204	18	59	43.1	4.51	1.002 2762	91.2	7.71	0.87	22 49.6
19	8	38	26.72	1.200	18	57	55.0	4.50	1.002 0523	95.4	7.71	0.87	22 46.1
20	8	38	57.38	1.275	18	56	7.0	4.50	1.001 8183	99.6	7.71	0.88	22 42.7
21	8	39	27.93	+1.270	+18	54	19.1	-4.49	1.001 5742	-103.8	7.72	0.88	22 39.3
22	8	39	58.36	1.265	18	52	31.4	4.49	1.001 3202	107.9	7.72	0.88	22 35.8
23	8	40	28.67	1.260	18	50	43.8	4.48	1.001 0562	112.1	7.73	0.88	22 32.4
24	8	40	58.86	1.255	18	48	56.4	4.47	1.000 7823	116.2	7.73	0.88	22 29.0
25	8	41	28.91	1.240	18	47	9.2	4.46	1.000 4985	120.3	7.74	0.88	22 25.5
26	8	41	58.82	+1.243	+18	45	22.3	-4.45	1.000 2048	-124.4	7.74	0.88	22 22.1
27	8	42	28.59	1.238	18	43	35.6	4.44	0.999 9013	128.5	7.75	0.88	22 18.6
28	8	42	58.22	1.231	18	41	49.1	4.43	0.999 5881	132.5	7.75	0.88	22 15.2
29	8	43	27.70	1.225	18	40	3.0	4.41	0.999 2651	136.6	7.76	0.88	22 11.8
30	8	43	57.03	1.219	18	38	17.2	4.40	0.998 9325	140.6	7.76	0.88	22 8.3
31	8	44	26.21	+1.212	+18	36	31.7	-4.39	0.998 5903	-144.6	7.77	0.88	22 4.9
Sept. 1	8	44	55.22	1.205	18	34	46.6	4.37	0.998 2386	148.6	7.78	0.88	22 1.4
2	8	45	24.07	1.199	18	33	1.8	4.36	0.997 8772	152.6	7.78	0.88	21 58.0
3	8	45	52.76	1.192	18	31	17.4	4.34	0.997 5063	156.5	7.79	0.88	21 54.5
4	8	46	21.27	1.184	18	29	33.5	4.32	0.997 1259	160.5	7.80	0.88	21 51.0
5	8	46	49.61	+1.177	+18	27	50.0	-4.30	0.996 7360	-164.4	7.80	0.89	21 47.6
6	8	47	17.77	1.170	18	26	6.9	4.29	0.996 3368	168.3	7.81	0.89	21 44.1
7	8	47	45.75	1.162	18	24	24.3	4.26	0.995 9282	172.2	7.82	0.89	21 40.6
8	8	48	13.53	1.154	18	22	42.2	4.24	0.995 5102	176.1	7.83	0.89	21 37.2
9	8	48	41.13	1.146	18	21	0.6	4.22	0.995 0829	180.0	7.83	0.89	21 33.7
10	8	49	8.52	+1.137	+18	19	19.6	-4.20	0.994 6464	-183.8	7.84	0.89	21 30.2
11	8	49	35.72	1.129	18	17	39.2	4.17	0.994 2007	187.6	7.85	0.89	21 26.7
12	8	50	2.71	1.120	18	15	59.3	4.15	0.993 7459	191.4	7.86	0.89	21 23.2
13	8	50	29.49	1.111	18	14	20.2	4.12	0.993 2820	195.2	7.87	0.89	21 19.8
14	8	50	56.05	1.102	18	12	41.7	4.09	0.992 8091	198.9	7.87	0.90	21 16.3
15	8	51	22.39	+1.093	+18	11	3.9	-4.06	0.992 3272	-202.6	7.88	0.90	21 12.8
16	8	51	48.50	1.083	18	9	26.8	4.03	0.991 8364	206.3	7.89	0.90	21 9.3
17	8	52	14.39	1.074	18	7	50.4	4.00	0.991 3368	210.0	7.90	0.90	21 5.8
18	8	52	40.03	1.064	18	6	14.8	3.97	0.990 8284	213.6	7.91	0.90	21 2.2
19	8	53	5.44	1.054	18	4	40.0	3.94	0.990 3113	217.2	7.92	0.90	20 58.7
20	8	53	30.61	+1.044	+18	3	5.9	-3.90	0.989 7857	-220.8	7.93	0.90	20 55.2
21	8	53	55.53	1.033	18	1	32.8	3.86	0.989 2517	224.3	7.94	0.90	20 51.7
22	8	54	20.19	1.022	18	0	0.5	3.83	0.988 7093	227.7	7.95	0.90	20 48.2
23	8	54	44.59	1.011	17	58	29.1	3.79	0.988 1587	231.1	7.96	0.90	20 44.6
24	8	55	8.73	1.000	17	56	58.6	3.75	0.987 5999	234.5	7.97	0.91	20 41.1
25	8	55	32.61	+0.989	+17	55	29.0	-3.71	0.987 0331	-237.8	7.98	0.91	20 37.6
26	8	55	56.22	0.978	17	54	0.4	3.67	0.986 4583	241.1	7.99	0.91	20 34.0
27	8	56	19.56	0.967	17	52	32.7	3.63	0.985 8757	244.4	8.00	0.91	20 30.5
28	8	56	42.62	0.955	17	51	6.0	3.59	0.985 2853	247.6	8.01	0.91	20 26.9
29	8	57	5.40	0.943	17	49	40.4	3.54	0.984 6872	250.8	8.02	0.91	20 23.4
30	8	57	27.89	+0.931	+17	48	15.9	-3.50	0.984 0816	-253.9	8.04	0.91	20 19.8
Oct. 1	8	57	50.09	+0.919	+17	46	52.4	-3.46	0.983 4685	-257.0	8.05	0.91	20 16.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit. Meridian of Greenwich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	Noon.	h	m
Oct.	1	8 57	50.09	+0.919	+17 46	52.4		-3.46	0.983 4685	-257.0	8.05	0.91	20 16.2		
	2	8 58	12.01	0.907	17 45	29.9		3.41	0.982 8479	260.1	8.06	0.92	20 12.7		
	3	8 58	33.62	0.894	17 44	8.6		3.36	0.982 2201	263.1	8.07	0.92	20 9.1		
	4	8 58	54.94	0.882	17 42	48.5		3.32	0.981 5851	266.1	8.08	0.92	20 5.5		
	5	8 59	15.95	0.869	17 41	29.5		3.27	0.980 9430	269.0	8.09	0.92	20 1.9		
	6	8 59	36.66	+0.856	+17 40	11.7		-3.22	0.980 2938	-271.9	8.11	0.92	19 58.3		
	7	8 59	57.05	0.843	17 38	55.1		3.17	0.979 6378	274.8	8.12	0.92	19 54.7		
	8	9 0	17.13	0.830	17 37	39.7		3.11	0.978 9750	277.6	8.13	0.92	19 51.1		
	9	9 0	36.88	0.816	17 36	25.6		3.06	0.978 3055	280.3	8.14	0.93	19 47.5		
	10	9 0	56.31	0.802	17 35	12.8		3.01	0.977 6294	283.0	8.16	0.93	19 43.9		
	11	9 1	15.40	+0.788	+17 34	1.3		-2.96	0.976 9469	-286.7	8.17	0.93	19 40.3		
	12	9 1	34.15	0.774	17 32	51.2		2.89	0.976 2581	288.3	8.18	0.93	19 36.6		
	13	9 1	52.57	0.760	17 31	42.4		2.84	0.975 5632	290.8	8.19	0.93	19 33.0		
	14	9 2	10.64	0.746	17 30	35.0		2.78	0.974 8624	293.2	8.21	0.93	19 29.4		
	15	9 2	28.36	0.731	17 29	29.0		2.72	0.974 1557	295.6	8.22	0.93	19 25.7		
	16	9 2	45.72	+0.716	+17 28	24.5		-2.66	0.973 4433	-298.0	8.23	0.94	19 22.1		
	17	9 3	2.73	0.701	17 27	21.5		2.59	0.972 7254	300.3	8.25	0.94	19 18.4		
	18	9 3	19.38	0.686	17 26	20.0		2.53	0.972 0021	302.5	8.26	0.94	19 14.8		
	19	9 3	35.67	0.671	17 25	20.0		2.47	0.971 2735	304.6	8.28	0.94	19 11.1		
	20	9 3	51.58	0.655	17 24	21.6		2.40	0.970 5400	306.6	8.29	0.94	19 7.4		
	21	9 4	7.12	+0.640	+17 23	24.7		-2.34	0.969 8017	-308.6	8.30	0.94	19 3.7		
	22	9 4	22.28	0.624	17 22	29.4		2.27	0.969 0587	310.5	8.32	0.94	19 0.0		
	23	9 4	37.07	0.608	17 21	35.6		2.21	0.968 3113	312.3	8.33	0.95	18 56.4		
	24	9 4	51.47	0.592	17 20	43.5		2.14	0.967 5595	314.1	8.35	0.95	18 52.7		
	25	9 5	5.49	0.576	17 19	53.0		2.07	0.966 8036	315.8	8.36	0.95	18 49.0		
	26	9 5	19.12	+0.560	+17 19	4.2		-2.00	0.966 0438	-317.4	8.38	0.95	18 45.3		
	27	9 5	32.36	0.543	17 18	17.0		1.93	0.965 2802	318.9	8.39	0.95	18 41.5		
	28	9 5	45.20	0.527	17 17	31.5		1.86	0.964 5131	320.3	8.40	0.95	18 37.8		
	29	9 5	57.65	0.510	17 16	47.7		1.79	0.963 7426	321.7	8.42	0.96	18 34.1		
	30	9 6	9.70	0.494	17 16	5.6		1.72	0.962 9689	323.0	8.44	0.96	18 30.4		
	31	9 6	21.34	+0.476	+17 15	25.3		-1.64	0.962 1921	-324.3	8.45	0.96	18 26.6		
Nov.	1	9 6	32.57	0.460	17 14	46.7		1.57	0.961 4125	325.4	8.47	0.96	18 22.9		
	2	9 6	43.40	0.443	17 14	9.9		1.50	0.960 6301	326.5	8.48	0.96	18 19.1		
	3	9 6	53.82	0.425	17 13	34.8		1.42	0.959 8453	327.5	8.50	0.97	18 15.3		
	4	9 7	3.82	0.408	17 13	1.6		1.35	0.959 0581	328.4	8.51	0.97	18 11.6		
	5	9 7	13.40	+0.390	+17 12	30.2		-1.27	0.958 2689	-329.3	8.53	0.97	18 7.8		
	6	9 7	22.56	0.373	17 12	0.6		1.19	0.957 4777	330.0	8.54	0.97	18 4.0		
	7	9 7	31.29	0.355	17 11	32.9		1.11	0.956 6848	330.7	8.56	0.97	18 0.2		
	8	9 7	39.60	0.337	17 11	7.1		1.04	0.955 8906	331.2	8.57	0.97	17 56.4		
	9	9 7	47.47	0.319	17 10	43.2		0.96	0.955 0949	331.7	8.59	0.98	17 52.6		
	10	9 7	54.91	+0.301	+17 10	21.2		-0.88	0.954 2984	-332.0	8.61	0.98	17 48.8		
	11	9 8	1.91	0.283	17 10	1.1		0.80	0.953 5012	332.3	8.62	0.98	17 45.0		
	12	9 8	8.48	0.265	17 9	42.9		0.72	0.952 7034	332.5	8.64	0.98	17 41.1		
	13	9 8	14.61	0.246	17 9	26.7		0.63	0.951 9053	332.6	8.65	0.98	17 37.3		
	14	9 8	20.29	0.228	17 9	12.5		0.55	0.951 1072	332.5	8.67	0.98	17 33.4		
	15	9 8	25.53	+0.209	+17 9	0.2		-0.47	0.950 3093	-332.4	8.68	0.99	17 29.6		
	16	9 8	30.33	+0.191	+17 8	49.8		-0.39	0.949 5119	-332.1	8.70	0.99	17 25.7		

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Paralax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Nov. 16	9	8	30.33	+0.191	+17	8	49.8	-0.39	0.949 5119	-332.1	8.70	0.99	17 25.7
17	9	8	34.68	0.172	17	8	41.4	0.31	0.948 7153	331.7	8.72	0.99	17 21.9
18	9	8	38.58	0.153	17	8	35.0	0.23	0.947 9199	331.1	8.73	0.99	17 18.0
19	9	8	42.02	0.134	17	8	30.6	0.14	0.947 1259	330.5	8.75	0.99	17 14.1
20	9	8	45.02	0.116	17	8	28.1	-0.06	0.946 3334	329.8	8.76	1.00	17 10.2
21	9	8	47.57	+0.097	+17	8	27.7	+0.02	0.945 5428	-329.0	8.78	1.00	17 6.3
22	9	8	49.67	0.078	17	8	29.2	0.11	0.944 7543	328.1	8.80	1.00	17 2.4
23	9	8	51.32	0.059	17	8	32.8	0.19	0.943 9681	327.0	8.81	1.00	16 58.5
24	9	8	52.52	0.041	17	8	38.3	0.27	0.943 1846	325.9	8.83	1.00	16 54.6
25	9	8	53.27	0.022	17	8	45.8	0.35	0.942 4040	324.6	8.84	1.00	16 50.7
26	9	8	53.57	+0.003	+17	8	55.3	+0.44	0.941 6266	-323.2	8.86	1.01	16 46.8
27	9	8	53.42	-0.015	17	9	6.7	0.52	0.940 8526	321.7	8.88	1.01	16 42.8
28	9	8	52.82	0.034	17	9	20.1	0.60	0.940 0823	320.2	8.89	1.01	16 38.9
29	9	8	51.77	0.053	17	9	35.4	0.68	0.939 3158	318.5	8.91	1.01	16 34.9
30	9	8	50.27	0.072	17	9	52.7	0.76	0.938 5535	316.7	8.92	1.01	16 31.0
Dec. 1	9	8	48.33	-0.090	+17	10	12.0	+0.85	0.937 7956	-314.8	8.94	1.02	16 27.0
2	9	8	45.94	0.109	17	10	33.3	0.93	0.937 0424	312.8	8.95	1.02	16 23.0
3	9	8	43.10	0.128	17	10	56.5	1.01	0.936 2942	310.6	8.97	1.02	16 19.0
4	9	8	39.81	0.146	17	11	21.6	1.09	0.935 5514	308.4	8.99	1.02	16 15.0
5	9	8	36.08	0.165	17	11	48.7	1.17	0.934 8141	306.0	9.00	1.02	16 11.0
6	9	8	31.91	-0.183	+17	12	17.7	+1.25	0.934 0827	-303.5	9.02	1.02	16 7.0
7	9	8	27.29	0.202	17	12	48.6	1.33	0.933 3574	300.9	9.03	1.03	16 3.0
8	9	8	22.23	0.220	17	13	21.5	1.41	0.932 6385	298.1	9.05	1.03	15 59.0
9	9	8	16.73	0.238	17	13	56.2	1.49	0.931 9264	295.2	9.06	1.03	15 55.0
10	9	8	10.79	0.256	17	14	32.8	1.56	0.931 2213	292.2	9.07	1.03	15 50.9
11	9	8	4.43	-0.274	+17	15	11.3	+1.64	0.930 5236	-289.2	9.09	1.03	15 46.9
12	9	7	57.63	0.292	17	15	51.7	1.72	0.929 8335	285.9	9.10	1.03	15 42.8
13	9	7	50.40	0.310	17	16	33.8	1.79	0.929 1514	282.5	9.12	1.04	15 38.8
14	9	7	42.75	0.328	17	17	17.8	1.87	0.928 4776	279.0	9.13	1.04	15 34.7
15	9	7	34.67	0.345	17	18	3.5	1.94	0.927 8123	275.4	9.15	1.04	15 30.7
16	9	7	26.18	-0.362	+17	18	51.0	+2.01	0.927 1559	-271.6	9.16	1.04	15 26.6
17	9	7	17.27	0.380	17	19	40.2	2.09	0.926 5086	267.8	9.17	1.04	15 22.5
18	9	7	7.96	0.396	17	20	31.1	2.15	0.925 8708	263.7	9.19	1.04	15 18.4
19	9	6	58.25	0.413	17	21	23.6	2.22	0.925 2427	259.6	9.20	1.05	15 14.3
20	9	6	48.14	0.429	17	22	17.8	2.30	0.924 6246	255.4	9.21	1.05	15 10.2
21	9	6	37.64	-0.446	+17	23	13.7	+2.36	0.924 0167	-251.1	9.23	1.05	15 6.1
22	9	6	26.75	0.461	17	24	11.1	2.42	0.923 4194	246.6	9.24	1.05	15 2.0
23	9	6	15.49	0.477	17	25	10.0	2.49	0.922 8328	242.1	9.25	1.05	14 57.9
24	9	6	3.85	0.493	17	26	10.5	2.55	0.922 2573	237.4	9.26	1.05	14 53.7
25	9	5	51.84	0.508	17	27	12.4	2.61	0.921 6931	232.7	9.28	1.05	14 49.6
26	9	5	39.48	-0.522	+17	28	15.7	+2.67	0.921 1403	-227.9	9.29	1.06	14 45.4
27	9	5	26.76	0.537	17	29	20.5	2.73	0.920 5993	222.9	9.30	1.06	14 41.3
28	9	5	13.69	0.552	17	30	26.6	2.78	0.920 0702	217.9	9.31	1.06	14 37.2
29	9	5	0.27	0.566	17	31	34.1	2.84	0.919 5533	212.8	9.32	1.06	14 33.0
30	9	4	46.52	0.580	17	32	42.9	2.89	0.919 0489	207.5	9.33	1.06	14 28.8
31	9	4	32.44	-0.594	+17	33	53.0	+2.95	0.918 5573	-202.1	9.34	1.06	14 24.7
32	9	4	18.03	...	+17	35	4.4	...	0.918 0786	...	9.35	1.06	14 20.5

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	" "	"	" ' "	"		
Jan.	1	116 31 51.0	2 13.49	+12.2	+0 9 16.3	+5.79	0.957 1250	+64.3
	9	116 49 38.8	2 13.46	13.2	0 10 2.6	5.79	0.957 1767	65.0
	17	117 7 26.4	2 13.43	14.2	0 10 48.9	5.78	0.957 2290	65.7
	25	117 25 13.7	2 13.40	15.2	0 11 35.1	5.78	0.957 2818	66.4
Feb.	2	117 43 0.8	2 13.37	16.2	0 12 21.3	5.78	0.957 3352	67.1
	10	118 0 47.6	2 13.34	+17.2	+0 13 7.5	+5.77	0.957 3891	+67.8
	18	118 18 34.2	2 13.31	18.2	0 13 53.7	5.77	0.957 4436	68.4
	26	118 36 20.5	2 13.28	19.2	0 14 39.8	5.76	0.957 4986	69.1
Mar.	6	118 54 6.6	2 13.24	20.2	0 15 25.9	5.76	0.957 5542	69.8
	14	119 11 52.4	2 13.21	21.2	0 16 12.0	5.76	0.957 6103	70.4
	22	119 29 37.9	2 13.17	+22.1	+0 16 58.0	+5.75	0.957 6669	+71.1
	30	119 47 23.2	2 13.13	23.1	0 17 44.0	5.74	0.957 7241	71.9
Apr.	7	120 5 8.2	2 13.09	24.1	0 18 29.9	5.74	0.957 7819	72.5
	15	120 22 52.9	2 13.06	25.1	0 19 15.8	5.74	0.957 8401	73.2
	23	120 40 37.4	2 13.04	26.0	0 20 1.7	5.73	0.957 8990	73.9
May	1	120 58 21.6	2 13.01	+27.0	+0 20 47.5	+5.72	0.957 9584	+74.6
	9	121 16 5.5	2 12.97	28.0	0 21 33.2	5.71	0.958 0183	75.2
	17	121 33 49.1	2 12.94	28.9	0 22 18.9	5.71	0.958 0787	75.9
	25	121 51 32.5	2 12.91	29.9	0 23 4.6	5.71	0.958 1397	76.6
June	2	122 9 15.6	2 12.87	30.8	0 23 50.2	5.70	0.958 2012	77.2
	10	122 26 58.4	2 12.83	+31.8	+0 24 35.8	+5.69	0.958 2632	+77.8
	18	122 44 40.9	2 12.79	32.7	0 25 21.3	5.69	0.958 3258	78.5
	26	123 2 23.1	2 12.76	33.7	0 26 6.8	5.68	0.958 3888	79.1
July	4	123 20 5.0	2 12.72	34.6	0 26 52.2	5.67	0.958 4523	79.7
	12	123 37 46.6	2 12.69	35.6	0 27 37.5	5.67	0.958 5163	80.4
	20	123 55 28.0	2 12.65	+36.5	+0 28 22.9	+5.66	0.958 5809	+81.0
	28	124 13 9.0	2 12.61	37.4	0 29 8.1	5.65	0.958 6459	81.6
Aug.	5	124 30 49.7	2 12.57	38.4	0 29 53.3	5.64	0.958 7115	82.2
	13	124 48 30.1	2 12.54	39.3	0 30 38.4	5.63	0.958 7775	82.9
	21	125 6 10.3	2 12.50	40.2	0 31 23.4	5.62	0.958 8441	83.6
	29	125 23 50.1	2 12.46	+41.1	+0 32 8.4	+5.62	0.958 9112	+84.1
Sept.	6	125 41 29.6	2 12.42	42.0	0 32 53.3	5.61	0.958 9787	84.7
	14	125 59 8.8	2 12.38	42.9	0 33 38.2	5.60	0.959 0467	85.3
	22	126 16 47.6	2 12.34	43.8	0 34 23.0	5.59	0.959 1152	85.9
	30	126 34 26.2	2 12.30	44.7	0 35 7.7	5.59	0.959 1842	86.5
Oct.	8	126 52 4.4	2 12.26	+45.6	+0 35 52.4	+5.58	0.959 2536	+87.1
	16	127 9 42.3	2 12.22	46.5	0 36 37.0	5.57	0.959 3236	87.8
	24	127 27 19.9	2 12.18	47.4	0 37 21.5	5.56	0.959 3941	88.4
Nov.	1	127 44 57.1	2 12.13	48.2	0 38 6.0	5.55	0.959 4650	89.0
	9	128 2 34.0	2 12.09	49.1	0 38 50.3	5.54	0.959 5365	89.6
	17	128 20 10.6	2 12.06	+49.9	+0 39 34.6	+5.53	0.959 6084	+90.2
	25	128 37 46.9	2 12.01	50.8	0 40 18.8	5.52	0.959 6809	90.9
Dec.	3	128 55 22.8	2 11.97	51.7	0 41 2.9	5.51	0.959 7538	91.4
	11	129 12 58.4	2 11.92	52.5	0 41 47.0	5.50	0.959 8272	92.1
	19	129 30 33.6	2 11.88	53.3	0 42 31.0	5.49	0.959 9011	92.6
	27	129 48 8.5	2 11.84	+54.2	+0 43 14.9	+5.48	0.959 9754	+93.1
	35	130 5 43.1	2 11.80	+55.0	+0 43 58.7	+5.47	0.960 0501	+93.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.		Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.		Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	"	h m
Jan.	3	21 21	21.53	+11.851	-16 11	12.3		+55.96	1.317 1981	+3999.8	1.62	0.43		2 30.8
	7	21 22	9.72	12.329	16 7	24.6		57.83	1.317 9972	1895.1	1.61	0.42		2 15.9
	11	21 22	59.38	12.584	16 3	29.9		59.52	1.318 7134	1684.8	1.61	0.42		2 1.0
	15	21 23	50.33	12.836	15 59	28.7		61.03	1.319 3442	1468.1	1.61	0.42		1 46.1
	19	21 24	42.41	13.147	15 55	21.9		62.34	1.319 8871	1245.6	1.60	0.42		1 31.2
	23	21 25	35.44	+13.358	-15 51	10.2		+63.47	1.320 3399	+1017.5	1.60	0.42		1 16.4
	27	21 26	29.21	13.519	15 46	54.5		64.33	1.320 7006	785.6	1.60	0.42		1 1.6
	31	21 27	23.53	13.682	15 42	35.9		64.95	1.320 9682	552.6	1.60	0.42		0 46.7
Feb.	4	21 28	18.20	13.898	15 38	15.2		65.37	1.321 1426	319.1	1.60	0.42		0 31.9
	8	21 29	13.05	13.718	15 33	53.2		65.60	1.321 2234	+ 85.0	1.60	0.42		0 17.0
	12	21 30	7.89	+13.696	-15 29	30.7		+65.61	1.321 2106	- 146.9	1.60	0.42		0 2.1
	16	21 31	2.56	13.630	15 25	8.6		65.39	1.321 1044	381.9	1.60	0.42		23 43.7
	20	21 31	58.87	13.518	15 20	47.9		64.96	1.320 9052	614.3	1.60	0.42		23 28.9
	24	21 32	50.64	13.367	15 16	29.3		64.27	1.320 6133	844.3	1.60	0.42		23 14.1
	28	21 33	43.66	13.145	15 12	14.1		63.38	1.320 2304	1069.3	1.60	0.42		22 59.2
Mar.	4	21 34	35.75	+12.895	-15 8	2.9		+62.21	1.319 7586	-1298.8	1.61	0.42		22 44.4
	8	21 35	26.77	12.607	15 3	56.7		60.86	1.319 2601	1508.7	1.61	0.42		22 29.5
	12	21 36	16.55	12.278	14 59	56.3		60.33	1.318 5572	1710.7	1.61	0.42		22 14.6
	16	21 37	4.94	11.909	14 56	2.4		57.57	1.317 8323	1918.0	1.61	0.42		21 59.6
	20	21 37	51.77	11.502	14 52	16.0		55.61	1.317 0277	2106.8	1.62	0.42		21 44.7
	24	21 38	36.90	+11.054	-14 48	37.8		+53.42	1.316 1464	-2296.1	1.62	0.42		21 29.7
	28	21 39	20.15	10.565	14 45	8.9		51.03	1.315 1922	2473.1	1.62	0.43		21 14.7
Apr.	1	21 40	1.38	10.046	14 41	49.8		48.46	1.314 1694	2638.7	1.63	0.43		20 59.6
	5	21 40	40.48	9.496	14 38	41.4		45.73	1.313 0826	2794.1	1.63	0.43		20 44.5
	9	21 41	17.31	8.917	14 35	44.1		42.86	1.311 9355	2939.3	1.63	0.43		20 29.4
	13	21 41	51.79	+ 8.214	-14 32	58.7		+39.81	1.310 7327	-3072.7	1.64	0.43		20 14.3
	17	21 42	23.78	7.678	14 30	25.8		36.61	1.309 4789	3194.6	1.64	0.43		19 59.1
	21	21 42	53.18	7.017	14 28	6.0		33.25	1.308 1787	3304.0	1.65	0.43		19 43.8
	25	21 43	19.88	6.339	14 26	0.0		29.75	1.306 8377	3396.1	1.65	0.43		19 28.5
	29	21 43	43.79	5.624	14 24	8.1		26.18	1.305 4622	3477.2	1.66	0.43		19 13.2
May	3	21 44	4.85	+ 4.903	-14 22	30.7		+22.51	1.304 0579	-3541.5	1.66	0.44		18 57.8
	7	21 44	23.00	4.172	14 21	8.1		18.79	1.302 6310	3590.7	1.67	0.44		18 42.3
	11	21 44	38.21	3.430	14 20	0.5		14.96	1.301 1873	3625.5	1.68	0.44		18 26.9
	15	21 44	50.42	2.674	14 19	8.3		11.12	1.299 7326	3645.7	1.68	0.44		18 11.3
	19	21 44	59.59	1.908	14 18	31.6		7.23	1.298 2730	3648.8	1.69	0.44		17 55.7
	23	21 45	5.68	+ 1.138	-14 18	10.5		+ 3.30	1.296 8159	-3634.0	1.69	0.44		17 40.1
	27	21 45	8.70	+ 0.373	14 18	5.2		- 0.61	1.295 3681	3601.9	1.70	0.45		17 24.4
	31	21 45	8.67	- 0.386	14 18	15.3		4.45	1.293 9367	3552.1	1.70	0.45		17 8.7
June	4	21 45	5.62	1.137	14 18	40.7		8.24	1.292 5285	3487.1	1.71	0.45		16 52.9
	8	21 44	59.59	1.876	14 19	21.1		11.95	1.291 1492	3405.9	1.71	0.45		16 37.0
	12	21 44	50.63	- 2.602	-14 20	16.2		-15.00	1.289 8060	-3306.2	1.72	0.45		16 21.1
	16	21 44	38.79	3.316	14 21	25.8		19.16	1.288 5049	3194.0	1.72	0.45		16 5.2
	20	21 44	24.13	4.007	14 22	49.3		22.59	1.287 2532	3061.2	1.73	0.45		15 49.2
	24	21 44	6.77	4.670	14 24	26.3		25.86	1.286 0581	2912.4	1.73	0.45		15 33.2
	28	21 43	46.81	5.301	14 26	15.9		28.91	1.284 9253	2748.2	1.74	0.46		15 17.2
July	2	21 43	24.41	- 5.894	-14 28	17.3		-31.77	1.283 8614	-2670.0	1.74	0.46		15 1.1
	6	21 42	59.70	- 6.455	-14 30	29.8		-34.43	1.282 8710	-2379.2	1.75	0.46		14 44.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent Declination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"		"	"	"	h m
July 2	21 43 24.41	-5.894	-14 28 17.3	-31.77	1.283 8614	-2570.0	1.74	0.46	15 1.1
6	21 42 59.70	6.455	14 30 29.8	34.43	1.282 8710	2379.2	1.75	0.46	14 44.9
10	21 42 32.82	6.977	14 32 52.5	36.89	1.281 9598	2175.1	1.75	0.46	14 28.7
14	21 42 3.94	7.458	14 35 24.6	39.12	1.281 1326	1958.6	1.75	0.46	14 12.5
18	21 41 33.22	7.892	14 38 5.1	41.06	1.280 3946	1729.3	1.76	0.46	13 56.3
22	21 41 0.87	-8.274	-14 40 52.9	-42.76	1.279 7506	-1489.0	1.76	0.46	13 40.0
26	21 40 27.10	8.599	14 43 46.8	44.15	1.279 2046	1239.9	1.76	0.46	13 23.7
30	21 39 52.15	8.868	14 46 45.7	45.22	1.278 7596	984.0	1.76	0.46	13 7.4
Aug. 3	21 39 16.23	9.080	14 49 48.2	46.01	1.278 4180	728.8	1.77	0.46	12 51.1
7	21 38 39.58	9.238	14 52 53.4	46.51	1.278 1812	458.4	1.77	0.46	12 34.8
11	21 38 2.40	-9.339	-14 56 0.0	-46.72	1.278 0518	-188.8	1.77	0.46	12 18.4
15	21 37 24.95	9.377	14 59 6.8	46.63	1.278 0305	+ 83.7	1.77	0.46	12 2.1
19	21 36 47.47	9.351	15 2 12.6	46.20	1.278 1188	356.5	1.77	0.46	11 45.7
23	21 36 10.23	9.269	15 5 16.0	45.45	1.278 3155	627.5	1.77	0.46	11 29.4
27	21 35 33.48	9.104	15 8 15.8	44.40	1.278 6204	895.7	1.76	0.46	11 13.0
31	21 34 57.48	-8.888	-15 11 10.8	-43.05	1.279 0313	+1157.4	1.76	0.46	10 56.7
Sept. 4	21 34 22.45	8.618	15 13 59.9	41.48	1.279 5455	1412.7	1.76	0.46	10 40.4
8	21 33 48.61	8.293	15 16 42.3	39.65	1.280 1606	1661.9	1.76	0.46	10 24.1
12	21 33 16.18	7.910	15 19 16.7	37.50	1.280 8740	1903.9	1.76	0.46	10 7.9
16	21 32 45.41	7.468	15 21 42.0	35.13	1.281 6824	2125.9	1.75	0.46	9 51.7
20	21 32 16.51	-6.972	-15 23 57.4	-32.51	1.282 5810	+2354.7	1.75	0.46	9 35.5
24	21 31 49.70	6.428	15 26 1.8	29.68	1.283 5644	2560.6	1.74	0.46	9 19.3
28	21 31 25.14	5.844	15 27 54.6	26.68	1.284 6275	2751.5	1.74	0.46	9 3.1
Oct. 2	21 31 3.00	5.220	15 29 35.0	23.52	1.285 7636	2927.5	1.74	0.46	8 47.0
6	21 30 43.43	4.561	15 31 2.5	20.20	1.286 9676	3089.6	1.73	0.45	8 31.0
10	21 30 26.56	-3.867	-15 32 16.4	-16.75	1.288 2332	+3296.3	1.73	0.45	8 15.0
14	21 30 12.54	3.139	15 33 16.3	13.16	1.289 5544	3366.2	1.72	0.45	7 59.0
18	21 30 1.48	2.387	15 34 1.5	9.44	1.290 9237	3477.4	1.72	0.45	7 43.1
22	21 29 53.47	1.616	15 34 31.7	5.64	1.292 3338	3569.9	1.71	0.45	7 27.3
26	21 29 48.59	0.828	15 34 46.6	-1.53	1.293 7771	3643.3	1.70	0.45	7 11.5
30	21 29 46.86	-0.084	-15 34 46.3	+1.99	1.295 2461	+3699.3	1.70	0.45	6 55.7
Nov. 3	21 29 48.33	+0.768	15 34 30.6	5.86	1.296 7342	3737.8	1.69	0.44	6 40.0
7	21 29 53.01	1.572	15 33 59.4	9.75	1.298 2340	3758.6	1.69	0.44	6 24.4
11	21 30 0.91	2.379	15 33 12.6	13.64	1.299 7387	3761.8	1.68	0.44	6 8.8
15	21 30 12.04	3.186	15 32 10.3	17.51	1.301 2410	3746.7	1.67	0.44	5 53.2
19	21 30 26.38	+3.961	-15 30 52.6	+21.33	1.302 7335	+3712.3	1.67	0.44	5 37.7
23	21 30 43.86	4.756	15 29 19.8	25.04	1.304 2085	3660.3	1.66	0.44	5 22.3
27	21 31 4.40	5.512	15 27 32.4	28.67	1.305 6596	3592.3	1.66	0.43	5 6.9
Dec. 1	21 31 27.93	6.260	15 25 30.5	32.24	1.307 0804	3510.1	1.65	0.43	4 51.6
5	21 31 54.37	6.966	15 23 14.6	35.69	1.308 4656	3412.3	1.65	0.43	4 36.3
9	21 32 23.63	+7.680	-15 20 45.1	+39.04	1.309 8082	+3299.0	1.64	0.43	4 21.1
13	21 32 55.61	8.226	15 18 2.4	42.29	1.311 1030	3172.4	1.64	0.43	4 5.9
17	21 33 30.19	8.968	15 15 7.0	45.38	1.312 3442	3030.8	1.63	0.43	3 50.7
21	21 34 7.22	9.551	15 11 59.6	48.29	1.313 5259	2876.1	1.63	0.43	3 35.6
25	21 34 46.55	10.109	15 8 40.9	51.04	1.314 6437	2711.5	1.62	0.43	3 20.5
29	21 35 28.04	+10.629	-15 5 11.5	+53.62	1.315 6938	+2537.2	1.62	0.43	3 5.5
33	21 36 11.52	.....	-15 1 32.3	...	1.316 6720	.....	1.62	0.42	2 50.5

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		" ' "	"	"	" ' "	"		
Jan.	5	319 19 28.8	39.13	+7.0	-0 42 15.4	-0.22	1.300 2137	+18.8
	15	319 26 0.1	39.13	7.0	0 42 17.6	0.22	1.300 2325	18.8
	25	319 32 31.4	39.12	7.0	0 42 19.8	0.21	1.300 2513	18.8
Feb.	4	319 39 2.6	39.12	+7.0	-0 42 21.9	-0.21	1.300 2700	+18.7
	14	319 45 33.7	39.11	6.9	0 42 24.0	0.21	1.300 2886	18.6
	24	319 52 4.8	39.11	6.9	0 42 26.1	0.21	1.300 3071	18.6
Mar.	6	319 58 35.9	39.10	+6.9	-0 42 28.2	-0.21	1.300 3257	+18.5
	16	320 5 6.9	39.10	6.9	0 42 30.3	0.21	1.300 3441	18.4
	26	320 11 37.9	39.10	6.8	0 42 32.4	0.21	1.300 3624	18.3
Apr.	5	320 18 8.8	39.09	+6.8	-0 42 34.5	-0.21	1.300 3806	+18.2
	15	320 24 39.7	39.09	6.8	0 42 36.6	0.21	1.300 3989	18.2
	25	320 31 10.5	39.08	6.8	0 42 38.6	0.20	1.300 4171	18.1
May	5	320 37 41.3	39.08	+6.7	-0 42 40.7	-0.20	1.300 4352	+18.0
	15	320 44 12.0	39.07	6.7	0 42 42.7	0.20	1.300 4531	17.9
	25	320 50 42.7	39.07	6.7	0 42 44.8	0.20	1.300 4710	17.9
June	4	320 57 13.4	39.06	+6.7	-0 42 46.8	-0.20	1.300 4889	+17.8
	14	321 3 44.0	39.06	6.6	0 42 48.8	0.20	1.300 5067	17.8
	24	321 10 14.6	39.06	6.6	0 42 50.8	0.20	1.300 5244	17.7
July	4	321 16 45.1	39.05	+6.6	-0 42 52.8	-0.20	1.300 5421	+17.7
	14	321 23 15.6	39.05	6.6	0 42 54.8	0.20	1.300 5597	17.6
	24	321 29 46.1	39.04	6.5	0 42 56.8	0.20	1.300 5772	17.5
Aug.	3	321 36 16.5	39.04	+6.5	-0 42 58.8	-0.20	1.300 5947	+17.5
	13	321 42 46.8	39.03	6.5	0 43 0.8	0.19	1.300 6121	17.4
	23	321 49 17.1	39.03	6.4	0 43 2.7	0.19	1.300 6295	17.3
Sept.	2	321 55 47.4	39.02	+6.4	-0 43 4.6	-0.19	1.300 6468	+17.3
	12	322 2 17.6	39.02	6.4	0 43 6.5	0.19	1.300 6640	17.2
	22	322 8 47.8	39.02	6.4	0 43 8.5	0.19	1.300 6811	17.1
Oct.	2	322 15 18.0	39.01	+6.4	-0 43 10.4	-0.19	1.300 6982	+17.1
	12	322 21 48.1	39.01	6.3	0 43 12.3	0.19	1.300 7152	17.0
	22	322 28 18.1	39.00	6.3	0 43 14.2	0.19	1.300 7322	16.9
Nov.	1	322 34 48.1	39.00	+6.3	-0 43 16.1	-0.19	1.300 7491	+16.8
	11	322 41 18.1	39.00	6.2	0 43 17.9	0.18	1.300 7658	16.7
	21	322 47 48.1	38.99	6.2	0 43 19.8	0.18	1.300 7826	16.7
Dec.	1	322 54 18.0	38.99	+6.2	-0 43 21.6	-0.18	1.300 7993	+16.6
	11	323 0 47.8	38.98	6.2	0 43 23.5	0.18	1.300 8159	16.6
	21	323 7 17.6	38.98	6.1	0 43 25.3	0.18	1.300 8324	16.5
	31	323 13 47.4	38.97	+6.1	-0 43 27.2	-0.18	1.300 8489	+16.5
	41	323 20 17.1	38.97	+6.1	-0 43 29.0	-0.18	1.300 8654	+16.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m
Jan. 3	8	25	19.89	-6.346	+19	0	58.6	+22.35	1.463 9859	- 044.7	1.33	0.30	13	32.9
7	8	24	54.08	6.554	19	2	29.4	23.04	1.463 6430	770.4	1.33	0.30	13	16.7
11	8	24	27.51	6.722	19	4	2.7	23.57	1.463 3701	592.4	1.33	0.30	13	0.6
15	8	24	0.36	6.849	19	5	37.8	23.97	1.463 1697	409.3	1.33	0.30	12	44.4
19	8	23	32.78	6.930	19	7	14.3	24.24	1.463 0430	223.7	1.33	0.30	12	28.2
23	8	23	4.98	-6.964	+19	8	51.5	+24.31	1.462 9910	- 36.1	1.33	0.30	12	12.0
27	8	22	37.13	6.960	19	10	28.6	24.22	1.463 0141	+ 151.1	1.33	0.30	11	55.8
31	8	22	9.44	6.888	19	12	5.1	23.99	1.463 1116	336.2	1.33	0.30	11	39.7
Feb. 4	8	21	42.08	6.783	19	13	40.3	23.60	1.463 2827	519.0	1.33	0.30	11	23.5
8	8	21	15.23	6.637	19	15	13.7	23.07	1.463 5263	697.9	1.33	0.30	11	7.3
12	8	20	49.04	-6.448	+19	16	44.7	+22.39	1.463 8404	+ 871.9	1.33	0.30	10	51.1
16	8	20	23.70	6.218	19	18	12.7	21.61	1.464 2233	1042.5	1.33	0.30	10	35.0
20	8	19	59.35	5.948	19	19	37.4	20.68	1.464 6736	1207.0	1.33	0.30	10	18.9
24	8	19	36.17	5.636	19	20	58.0	19.62	1.465 1879	1363.9	1.32	0.30	10	2.8
28	8	19	14.31	5.288	19	22	14.2	18.46	1.465 7635	1511.8	1.32	0.30	9	46.7
Mar. 4	8	18	53.91	-4.907	+19	23	25.5	+17.18	1.466 3960	+1649.7	1.32	0.30	9	30.6
8	8	18	35.09	4.498	19	24	31.5	15.83	1.467 0820	1778.5	1.32	0.30	9	14.6
12	8	18	17.96	4.063	19	25	32.0	14.39	1.467 8175	1897.7	1.32	0.30	8	58.6
16	8	18	2.62	3.604	19	26	26.5	12.87	1.468 5988	2007.1	1.31	0.30	8	42.6
20	8	17	49.16	3.123	19	27	14.9	11.28	1.469 4217	2105.2	1.31	0.30	8	26.6
24	8	17	37.67	-2.616	+19	27	56.7	+ 9.63	1.470 2815	+2192.5	1.31	0.30	8	10.7
28	8	17	28.25	2.094	19	28	31.9	7.92	1.471 1740	2267.1	1.31	0.30	7	54.9
Apr. 1	8	17	20.93	1.564	19	29	0.2	6.19	1.472 0935	2328.9	1.30	0.30	7	39.0
5	8	17	15.75	1.023	19	29	21.4	4.44	1.473 0356	2379.6	1.30	0.30	7	23.2
9	8	17	12.75	-0.478	19	29	35.7	2.70	1.473 9956	2418.1	1.30	0.30	7	7.4
13	8	17	11.93	+0.070	+19	29	42.9	+ 0.89	1.474 9686	+2445.7	1.29	0.29	6	51.7
17	8	17	13.32	0.625	19	29	42.8	- 0.93	1.475 9507	2482.5	1.29	0.29	6	36.0
21	8	17	16.93	1.179	19	29	35.4	2.74	1.476 9370	2467.2	1.29	0.29	6	20.3
25	8	17	22.75	1.730	19	29	20.9	4.52	1.477 9228	2459.5	1.29	0.29	6	4.7
29	8	17	30.76	2.272	19	28	59.2	6.32	1.478 9030	2439.8	1.28	0.29	5	49.1
May 3	8	17	40.91	+2.802	+19	28	30.4	- 8.07	1.479 8732	+2409.2	1.28	0.29	5	33.5
7	8	17	53.16	3.321	19	27	54.7	9.78	1.480 8291	2369.3	1.28	0.29	5	18.0
11	8	18	7.46	3.826	19	27	12.2	11.47	1.481 7674	2320.6	1.27	0.29	5	2.5
15	8	18	23.75	4.318	19	26	23.0	13.13	1.482 6842	2261.5	1.27	0.29	4	47.1
19	8	18	41.99	4.798	19	25	27.2	14.75	1.483 5753	2192.5	1.27	0.29	4	31.6
23	8	19	2.11	+5.258	+19	24	25.1	-16.31	1.484 4370	+2114.5	1.27	0.29	4	16.2
27	8	19	24.03	5.698	19	23	16.8	17.82	1.485 2657	2027.6	1.26	0.29	4	0.9
31	8	19	47.66	6.111	19	22	2.6	19.26	1.486 0580	1932.7	1.26	0.29	3	45.6
June 4	8	20	12.89	6.501	19	20	42.8	20.63	1.486 8110	1830.7	1.26	0.29	3	30.2
8	8	20	39.64	6.870	19	19	17.6	21.95	1.487 5217	1722.5	1.26	0.29	3	14.9
12	8	21	7.82	+7.217	+19	17	47.3	-23.20	1.488 1882	+1608.9	1.26	0.29	2	59.7
16	8	21	37.34	7.537	19	16	12.1	24.39	1.488 8079	1487.9	1.25	0.29	2	44.5
20	8	22	8.08	7.830	19	14	32.3	25.49	1.489 3777	1360.7	1.25	0.28	2	29.3
24	8	22	39.94	8.095	19	12	48.3	26.49	1.489 8958	1228.5	1.25	0.28	2	14.1
28	8	23	12.80	8.331	19	11	0.5	27.40	1.490 3599	1091.5	1.25	0.28	1	58.9
July 2	8	23	46.55	+8.536	+19	9	9.2	-28.23	1.490 7686	+ 951.4	1.25	0.28	1	43.7
6	8	24	21.05	+8.710	+19	7	14.8	-28.96	1.491 1207	+ 809.2	1.25	0.28	1	28.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"					h m	
July	2	8 23	46.55	+8.536	+19	9	9.2	-28.23	1.490 7686	+ 951.4	1.25	0.28	1 43.7	
	6	8 24	21.05	8.710	19	7	14.8	28.96	1.491 1207	809.3	1.25	0.28	1 28.6	
	10	8 24	56.20	8.861	19	5	17.6	29.63	1.491 4155	663.5	1.25	0.28	1 13.4	
	14	8 25	31.90	8.983	19	3	17.9	30.19	1.491 6511	514.7	1.25	0.28	0 58.3	
	18	8 26	8.02	9.073	19	1	16.2	30.66	1.491 8269	363.3	1.25	0.28	0 43.1	
	22	8 26	44.44	+9.129	+18	59	12.8	-30.99	1.491 9415	+ 210.2	1.25	0.28	0 28.0	
	26	8 27	21.02	9.153	18	57	8.4	31.22	1.491 9950	+ 56.8	1.25	0.28	0 12.9	
	30	8 27	57.62	9.145	18	55	3.2	31.34	1.491 9869	- 97.0	1.25	0.28	23 54.0	
	Aug.	3	8 28	34.13	9.108	18	52	57.8	31.37	1.491 9176	248.8	1.25	0.28	23 38.9
		7	8 29	10.45	9.047	18	50	52.4	31.29	1.491 7879	400.6	1.25	0.28	23 23.7
	11	8 29	46.46	+8.963	+18	48	47.6	-31.11	1.491 5971	- 552.9	1.25	0.28	23 8.6	
	15	8 30	22.02	8.894	18	46	43.7	30.79	1.491 3458	703.3	1.25	0.28	22 53.4	
	19	8 30	57.01	8.665	18	44	41.4	30.37	1.491 0348	851.4	1.25	0.28	22 38.3	
	23	8 31	31.30	8.475	18	42	40.9	29.83	1.490 6651	996.1	1.25	0.28	22 23.1	
	27	8 32	4.77	8.255	18	40	42.9	29.15	1.490 2384	1137.1	1.25	0.28	22 7.9	
	31	8 32	37.30	+8.007	+18	38	47.8	-28.38	1.489 7560	-1273.9	1.25	0.28	21 52.8	
	Sept.	4	8 33	8.79	7.733	18	36	56.0	27.52	1.489 2199	1406.0	1.25	0.28	21 37.6
		8	8 33	39.13	7.433	18	35	7.8	26.55	1.488 6318	1533.7	1.25	0.29	21 22.3
		12	8 34	8.22	7.106	18	33	23.8	26.43	1.487 9936	1656.8	1.26	0.29	21 7.1
		16	8 34	35.93	6.746	18	31	44.5	24.22	1.487 3072	1773.8	1.26	0.29	20 51.8
20		8 35	2.15	+6.300	+18	30	10.2	-22.91	1.486 5756	-1883.1	1.26	0.29	20 36.5	
24		8 35	26.78	5.962	18	28	41.4	21.46	1.485 8018	1984.4	1.26	0.29	20 21.2	
28		8 35	49.74	5.523	18	27	18.6	19.95	1.484 9892	2077.5	1.27	0.29	20 5.9	
Oct.		2	8 36	10.94	5.074	18	26	1.9	18.36	1.484 1409	2162.6	1.27	0.29	19 50.5
		6	8 36	30.31	4.607	18	24	51.8	16.69	1.483 2602	2239.9	1.27	0.29	19 35.1
10		8 36	47.77	+4.119	+18	23	48.5	-14.93	1.482 3502	-2308.0	1.27	0.29	19 19.6	
14		8 37	3.24	3.613	18	22	52.5	13.07	1.481 4152	2365.8	1.28	0.29	19 4.1	
18		8 37	16.65	3.089	18	22	4.0	11.16	1.480 4590	2413.1	1.28	0.29	18 48.6	
22	8 37	27.94	2.555	18	21	23.3	9.19	1.479 4863	2448.5	1.28	0.29	18 33.1		
26	8 37	37.08	2.014	18	20	50.5	7.19	1.478 5017	2472.5	1.28	0.29	18 17.5		
30	8 37	44.04	+1.465	+18	20	25.8	- 5.18	1.477 5098	-2485.4	1.29	0.29	18 1.9		
Nov.	3	8 37	48.79	0.911	18	20	9.3	3.10	1.476 5148	2487.8	1.29	0.29	17 46.2	
	7	8 37	51.32	+0.353	18	20	1.9	- 1.08	1.475 5212	2477.7	1.29	0.29	17 30.5	
	11	8 37	51.61	-0.206	18	20	1.1	+ 1.08	1.474 5343	2455.1	1.30	0.29	17 14.8	
	15	8 37	49.67	0.765	18	20	9.6	3.17	1.473 5588	2420.0	1.30	0.30	16 59.0	
	19	8 37	45.50	-1.316	+18	20	26.4	+ 5.22	1.472 6001	-2371.4	1.30	0.30	16 43.2	
23	8 37	39.16	1.855	18	20	51.3	7.23	1.471 6634	2310.1	1.30	0.30	16 27.4		
27	8 37	30.68	2.381	18	21	24.2	9.20	1.470 7536	2237.3	1.31	0.30	16 11.5		
Dec.	1	8 37	20.13	2.891	18	22	4.8	11.09	1.469 8751	2153.2	1.31	0.30	15 55.6	
	5	8 37	7.57	3.387	18	22	52.8	12.92	1.469 0326	2067.7	1.31	0.30	15 39.7	
	9	8 36	53.06	-3.861	+18	23	48.1	+14.69	1.468 2305	-1950.4	1.32	0.30	15 23.7	
	13	8 36	36.71	4.312	18	24	50.2	16.36	1.467 4739	1830.8	1.32	0.30	15 7.7	
	17	8 36	18.60	4.735	18	25	58.8	17.91	1.466 7673	1700.8	1.32	0.30	14 51.7	
	21	8 35	58.87	5.126	18	27	13.3	19.33	1.466 1146	1560.7	1.32	0.30	14 35.6	
	25	8 35	37.64	5.481	18	28	33.3	20.62	1.465 5199	1412.1	1.32	0.30	14 19.5	
	29	8 35	15.07	-5.794	+18	29	58.1	+21.77	1.464 9859	-1256.6	1.33	0.30	14 3.4	
	33	8 34	51.29	....	+18	31	27.3	....	1.464 5158	....	1.33	0.30	13 47.3

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	"	"	° ' "	"		
Jan.	5	123 22 54.7	21.74	-12.8	-0 13 53.4	+0.67	1.477 4598	+4.8
	15	123 26 32.1	21.74	12.7	0 13 46.7	0.67	1.477 4647	4.8
	25	123 30 9.5	21.74	12.6	0 13 40.0	0.67	1.477 4695	4.8
Feb.	4	123 33 47.0	21.74	-12.5	-0 13 33.3	+0.67	1.477 4743	+4.8
	14	123 37 24.4	21.74	12.4	0 13 26.7	0.67	1.477 4792	4.8
	24	123 41 1.8	21.74	12.3	0 13 20.0	0.67	1.477 4840	4.8
Mar.	6	123 44 39.2	21.74	-12.2	-0 13 13.4	+0.67	1.477 4889	+4.8
	16	123 48 16.7	21.74	12.1	0 13 6.7	0.67	1.477 4937	4.8
	26	123 51 54.1	21.74	12.0	0 13 0.1	0.67	1.477 4986	4.8
Apr.	5	123 55 31.6	21.74	-11.9	-0 12 53.4	+0.67	1.477 5034	+4.8
	15	123 59 9.0	21.74	11.8	0 12 46.7	0.67	1.477 5082	4.8
	25	124 2 46.5	21.74	11.7	0 12 40.0	0.67	1.477 5130	4.8
May	5	124 6 23.9	21.74	-11.6	-0 12 33.4	+0.67	1.477 5178	+4.8
	15	124 10 1.4	21.74	11.5	0 12 26.7	0.67	1.477 5226	4.8
	25	124 13 38.8	21.74	11.4	0 12 20.0	0.67	1.477 5274	4.8
June	4	124 17 16.3	21.74	-11.3	-0 12 13.3	+0.67	1.477 5322	+4.8
	14	124 20 53.7	21.75	11.2	0 12 6.7	0.67	1.477 5370	4.8
	24	124 24 31.2	21.75	11.1	0 12 0.0	0.67	1.477 5418	4.8
July	4	124 28 8.6	21.75	-11.0	-0 11 53.3	+0.67	1.477 5466	+4.8
	14	124 31 46.1	21.75	10.9	0 11 46.6	0.67	1.477 5513	4.8
	24	124 35 23.5	21.75	10.8	0 11 39.9	0.67	1.477 5561	4.8
Aug.	3	124 39 1.0	21.75	-10.7	-0 11 33.2	+0.67	1.477 5609	+4.8
	13	124 42 38.5	21.75	10.6	0 11 26.5	0.67	1.477 5657	4.8
	23	124 46 16.0	21.75	10.5	0 11 19.8	0.67	1.477 5704	4.8
Sept.	2	124 49 53.4	21.75	-10.4	-0 11 13.2	+0.67	1.477 5752	+4.7
	12	124 53 30.9	21.75	10.3	0 11 6.5	0.67	1.477 5799	4.7
	22	124 57 8.4	21.75	10.2	0 10 59.8	0.67	1.477 5847	4.7
Oct.	2	125 0 45.9	21.75	-10.1	-0 10 53.1	+0.67	1.477 5894	+4.7
	12	125 4 23.3	21.75	10.0	0 10 46.4	0.67	1.477 5941	4.7
	22	125 8 0.8	21.75	9.9	0 10 39.7	0.67	1.477 5988	4.7
Nov.	1	125 11 38.3	21.75	- 9.8	-0 10 33.0	+0.67	1.477 6035	+4.7
	11	125 15 15.8	21.75	9.7	0 10 26.3	0.67	1.477 6082	4.7
	21	125 18 53.3	21.75	9.6	0 10 19.7	0.67	1.477 6129	4.7
Dec.	1	125 22 30.8	21.75	- 9.5	-0 10 13.0	+0.67	1.477 6176	+4.7
	11	125 26 8.3	21.75	9.4	0 10 6.3	0.67	1.477 6223	4.7
	21	125 29 45.8	21.75	9.3	0 9 59.6	0.67	1.477 6269	4.7
	31	125 33 23.3	21.75	- 9.2	-0 9 52.9	+0.67	1.477 6316	+4.7
	41	125 37 0.8	21.75	- 9.1	-0 9 46.2	+0.67	1.477 6362	+4.6

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

200 FORMULÆ FOR THE REDUCTION OF STARS, 1917.

The constants of precession, nutation and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xviii, and together with the notation of BESSEL are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

<i>Terms of Long Period.</i>	<i>Terms of Short Period.</i>
$A = \tau - 0.342\ 20 \sin 2\ \Omega$	$-0.004\ 05 \sin 2\ \zeta$
$+ 0.004\ 15 \sin 2\ \Omega$	$+0.000\ 23 \sin (\zeta + \Gamma')$
$- 0.025\ 26 \sin 2\ L$	$+0.001\ 34 \sin (\zeta - \Gamma')$
$+ 0.002\ 51 \sin (L - \Gamma)$	$-0.000\ 68 \sin (2\ \zeta - \Omega)$
$- 0.000\ 99 \sin (3\ L - \Gamma)$	$-0.000\ 52 \sin (3\ \zeta - \Gamma')$
$+ 0.000\ 42 \sin (L + \Gamma)$	$+0.000\ 30 \sin (\zeta - 2\ L + \Gamma')$
$+ 0.000\ 25 \sin (2\ L - \Omega)$	$+0.000\ 12 \sin 2\ (\zeta - L)$
"	"
$B = - 9.210 \cos \Omega$	$-0.088 \cos 2\ \zeta$
$+ 0.090 \cos 2\ \Omega$	$-0.018 \cos (2\ \zeta - \Omega)$
$- 0.552 \cos 2\ L$	$-0.011 \cos (3\ \zeta - \Gamma')$
$- 0.023 \cos (3\ L - \Gamma)$	$+0.006 \cos (\zeta + \Gamma')$
$+ 0.009 \cos (L + \Gamma)$	
$+ 0.007 \cos (2\ L - \Omega)$	
$C = -20.4700 \cos \omega \cos \odot$	
$D = -20.4700 \sin \odot$	
$E = - 0.0416 \sin \Omega + 0''.0005 \sin 2\ \Omega - 0''.0031 \sin 2\ L$	

BESSEL'S Star-Constants.

$a = 3^s.072\ 65 + 1^s.836\ 86 \sin \alpha_0 \tan \delta_0$	$a' = 20''.0454 \cos \alpha_0$
$b = \frac{1}{15} \cos \alpha_0 \tan \delta_0$	$b' = -\sin \alpha_0$
$c = \frac{1}{15} \cos \alpha_0 \sec \delta_0$	$c' = \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$
$d = \frac{1}{15} \sin \alpha_0 \sec \delta_0$	$d' = \cos \alpha_0 \sin \delta_0$

Formulæ for reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \frac{1}{15}E \quad (\text{in time})$$

$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \quad (\text{in arc})$$

INDEPENDENT STAR-NUMBERS.

$$f + f' = +46''.0898\ A + E \quad (\text{in arc})$$

$$= +3^s.07265\ A + \frac{1}{15}E \quad (\text{in time})$$

$$f' = -0^s.0124 \sin 2\ \zeta + 0^s.0041 \sin (\zeta - \Gamma') + 0^s.0007 \sin (\zeta + \Gamma')$$

$$- 0^s.0021 \sin (2\ \zeta - \Omega) - 0^s.0016 \sin (3\ \zeta - \Gamma')$$

$$+ 0^s.0009 \sin (\zeta - 2\ L + \Gamma') + 0^s.0004 \sin 2\ (\zeta - L)$$

$$g \sin G = B \quad h \sin H = C \quad i = C \tan \omega$$

$$g \cos G = 20''.0454\ A \quad h \cos H = D$$

Formulæ for Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + f' + \tau\mu + \frac{1}{15}g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{15}h \sin (H + \alpha_0) \sec \delta_0 \quad (\text{in time})$$

$$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 \quad (\text{in arc})$$

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1917, January 0^d.217, Washington mean time),

$\alpha_0, \delta_0,$ the star's mean R. A. and Decl. at the beginning of the fictitious year,
 $\alpha, \delta,$ the star's apparent right ascension and declination at the time τ ,
 $\mu, \mu',$ the annual proper motion in right ascension and declination,

$\odot,$ the Sun's true longitude,
 $L,$ the Sun's mean longitude,
 $\Omega,$ the longitude of the Moon's ascending node,

$\omega,$ the obliquity of the ecliptic,
 $\Gamma,$ the long. of the Sun's perigee,
 $\Gamma',$ the long. of the Moon's perigee,
 $\zeta,$ the Moon's mean longitude.

The independent star-numbers are more convenient than BESSEL's when only one or two apparent positions of a star are required, or when BESSEL's star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, with the star-numbers of this Ephemeris, the quantities to be computed are $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca' - Db'$.

In the computation of the Besselian star-numbers given for Washington mean midnight of each day of the year, on pages 202-205, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included.

In the computation of the independent star-numbers, pages 206-213, the short-period terms have been included in the two columns headed G and $\text{Log } g$. The quantities f and f' give separately the effect of the long-period and short-period terms. f' differs but slightly from the quantity $-0''.1866 \sin 2 \zeta + 0''.0622 \sin (\zeta - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference of 1896, which quantity that conference decided should be omitted in the reduction of stars from mean to apparent place.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included. The quantity f' , which was omitted from the ephemerides of the circumpolar stars given in the *American Ephemeris and Nautical Almanac* for the years 1900 to 1915, inclusive, is now included in these ephemerides in accordance with the decision of the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911. See page 43 of *Procès-Verbaux* of that Congress.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm 0''.008 \tan \delta$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\Delta\alpha$ and $\Delta\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\begin{aligned}\Delta\alpha &= D_{\psi}\alpha \delta''\psi + D_{\omega}\alpha \delta''\omega \\ \Delta\delta &= D_{\psi}\delta \delta''\psi + D_{\omega}\delta \delta''\omega\end{aligned}$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 215-216, and have been computed as follows:

$$\delta''\psi = 50''.37 A_2 \qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 200.

The quantities $D_{\psi}\alpha$, $D_{\omega}\alpha$, $D_{\psi}\delta$, and $D_{\omega}\delta$ are given for each ten-day star on pages 316-513, and have been computed by means of the following formulæ:

$$\begin{aligned}D_{\psi}\alpha &= \frac{1}{15} (\cos \omega + \sin \alpha \tan \delta \sin \omega) & D_{\omega}\alpha &= -\frac{1}{15} \cos \alpha \tan \delta \\ D_{\psi}\delta &= \cos \alpha \sin \omega & D_{\omega}\delta &= \sin \alpha\end{aligned}$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 and in the *American Ephemeris and Nautical Almanac* for the years 1912 to 1915, inclusive, the value used for the derivative of the right ascension with reference to ψ was

$$D'_{\psi}\alpha = \frac{1}{15} \sin \alpha \tan \delta \sin \omega$$

and the addition of the term $\frac{1}{15} \cos \omega$ is made in accordance with the above-mentioned decision of the *Congrès International des Éphémérides Astronomiques* of 1911 with reference to the quantity f' .

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	+9.51342	-0.4500	-0.52391	+1.30413	Feb. 15	+9.67399	-0.4817	-1.19718	+1.04745
1	9.51677	0.4437	0.56460	1.30267	16	9.67843	0.4821	1.20206	1.03544
2	9.52128	0.4364	0.60168	1.30105	17	9.68278	0.4858	1.20674	1.02296
3	9.52686	0.4297	0.63570	1.29930	h 18	9.68668	0.4922	1.21124	1.00998
h 4	9.53322	0.4252	0.66713	1.29740	(10.0) 19	9.68965	0.5001	1.21557	0.99647
(7.0) 5	+9.53988	-0.4235	-0.69630	+1.29535	20	+9.69167	-0.5077	-1.21971	+0.98239
6	9.54637	0.4248	0.72351	1.29316	21	9.69277	0.5136	1.22368	0.96770
7	9.55236	0.4288	0.74898	1.29082	22	9.69328	0.5167	1.22748	0.95237
8	9.55758	0.4346	0.77290	1.28832	23	9.69364	0.5164	1.23111	0.93634
9	9.56190	0.4411	0.79545	1.28568	24	9.69433	0.5133	1.23458	0.91958
10	+9.56540	-0.4474	-0.81675	+1.28288	25	+9.69562	-0.5084	-1.23788	+0.90200
11	9.56812	0.4528	0.83692	1.27992	26	9.69774	0.5029	1.24103	0.88356
12	9.57019	0.4565	0.85607	1.27681	27	9.70049	0.4983	1.24402	0.86417
13	9.57201	0.4579	0.87427	1.27354	28	9.70370	0.4958	1.24685	0.84375
14	9.57388	0.4568	0.89161	1.27010	Mar. 1	9.70697	0.4957	1.24954	0.82219
15	+9.57616	-0.4534	-0.90815	+1.26650	2	+9.71005	-0.4960	-1.25207	+0.79938
16	9.57933	0.4483	0.92395	1.26272	3	9.71271	0.5022	1.25445	0.77518
17	9.58354	0.4427	0.93906	1.25878	4	9.71483	0.5073	1.25669	0.74943
18	9.58883	0.4382	0.95353	1.25466	5	9.71635	0.5126	1.25878	0.72192
h 19	9.59493	0.4362	0.96740	1.25037	h 6	9.71730	0.5172	1.26073	0.69243
(8.0) 20	+9.60133	-0.4378	-0.98070	+1.24590	(11.0) 7	+9.71780	-0.5206	-1.26254	+0.66066
21	9.60746	0.4430	0.99348	1.24124	8	9.71798	0.5222	1.26421	0.62627
22	9.61271	0.4510	1.00575	1.23639	9	9.71806	0.5217	1.26574	0.58879
23	9.61682	0.4601	1.01756	1.23135	10	9.71829	0.5190	1.26713	0.54764
24	9.61966	0.4683	1.02891	1.22611	11	9.71893	0.5144	1.26838	0.50206
25	+9.62150	-0.4743	-1.03983	+1.22067	12	+9.72021	-0.5085	-1.26950	+0.45101
26	9.62280	0.4769	1.05036	1.21503	13	9.72228	0.5025	1.27049	0.39304
27	9.62410	0.4761	1.06049	1.20918	14	9.72507	0.4976	1.27134	0.32599
28	9.62586	0.4726	1.07026	1.20311	15	9.72839	0.4961	1.27206	0.24655
29	9.62843	0.4675	1.07968	1.19682	16	9.73182	0.4956	1.27265	0.14913
30	+9.63190	-0.4626	-1.08876	+1.19030	17	+9.73500	-0.4990	-1.27310	+0.02325
31	9.63603	0.4592	1.09752	1.18354	18	9.73753	0.5043	1.27342	9.84518
Feb. 1	9.64053	0.4583	1.10597	1.17654	19	9.73924	0.5100	1.27362	+9.53808
2	9.64504	0.4601	1.11412	1.16929	20	9.74009	0.5145	1.27368	-7.98302
h 3	9.64921	0.4645	1.12198	1.16178	h 21	9.74037	0.5164	1.27361	9.56142
(9.0) 4	+9.65284	-0.4706	-1.12957	+1.15400	(12.0) 22	+9.74039	-0.5151	-1.27341	-9.85649
5	9.65577	0.4776	1.13689	1.14595	23	9.74066	0.5106	1.27308	0.03041
6	9.65798	0.4846	1.14395	1.13761	24	9.74145	0.5038	1.27262	0.15410
7	9.65959	0.4907	1.15077	1.12897	25	9.74290	0.4960	1.27203	0.25010
8	9.66068	0.4954	1.15734	1.12002	26	9.74509	0.4884	1.27131	0.32852
9	+9.66142	-0.4980	-1.16368	+1.11075	27	+9.74775	-0.4826	-1.27046	-0.39477
10	9.66211	0.4984	1.16980	1.10114	28	9.75064	0.4792	1.26948	0.45209
11	9.66303	0.4965	1.17569	1.09117	29	9.75344	0.4784	1.26837	0.50258
12	9.66452	0.4928	1.18137	1.08084	30	9.75588	0.4797	1.26713	0.54766
13	9.66683	0.4883	1.18684	1.07012	31	9.75791	0.4824	1.26575	0.58837
14	+9.67004	-0.4841	-1.19211	+1.05900	Apr. 1	+9.75937	-0.4855	-1.26424	-0.62542
15	+9.67399	-0.4817	-1.19718	+1.04745	2	+9.76035	-0.4882	-1.26260	-0.65942

E = +0".04 = +0.003

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Std. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Std. Hr.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	+9.75937	-0.4855	-1.26424	-0.62542	May 17	+9.83469	-0.3062	-1.01346	-1.23314
2	9.76035	0.4882	1.26260	0.65942	18	9.83619	0.2912	1.00215	1.23785
3	9.76090	0.4898	1.26083	0.69082	19	9.83834	0.2752	0.99041	1.24239
4	9.76116	0.4897	1.25892	0.71997	20	9.84100	0.2805	0.97823	1.24675
h 5	9.76130	0.4874	1.25687	0.74714	h 21	9.84402	0.2492	0.96558	1.25096
(13.0) 6	+9.76153	-0.4827	-1.25469	-0.77258	(16.0) 22	+9.84716	-0.2424	-0.95242	-1.25499
7	9.76205	0.4758	1.25237	0.79647	23	9.85012	0.2402	0.93873	1.25887
8	9.76313	0.4672	1.24991	0.81899	24	9.85277	0.2415	0.92448	1.26259
9	9.76490	0.4580	1.24731	0.84026	25	9.85502	0.2448	0.90962	1.26616
10	9.76736	0.4494	1.24456	0.86041	26	9.85681	0.2484	0.89412	1.26957
11	+9.77036	-0.4430	-1.24167	-0.87953	27	+9.85820	-0.2510	-0.87792	-1.27284
12	9.77363	0.4397	1.23864	0.89772	28	9.85931	0.2513	0.86098	1.27596
13	9.77674	0.4401	1.23546	0.91505	29	9.86020	0.2486	0.84322	1.27894
14	9.77938	0.4430	1.23213	0.93158	30	9.86111	0.2422	0.82459	1.28177
15	9.78132	0.4471	1.22865	0.94737	31	9.86218	0.2320	0.80500	1.28446
16	+9.78252	-0.4505	-1.22501	-0.96248	June 1	+9.86355	-0.2185	-0.78438	-1.28702
17	9.78309	0.4515	1.22122	0.97696	2	9.86541	0.2025	0.76260	1.28944
18	9.78335	0.4490	1.21727	0.99083	3	9.86781	0.1863	0.73955	1.29172
19	9.78373	0.4427	1.21315	1.00415	4	9.87073	0.1723	0.71509	1.29387
h 20	9.78453	0.4332	1.20887	1.01695	h 5	9.87400	0.1631	0.68905	1.29589
(14.0) 21	+9.78596	-0.4218	-1.20443	-1.02925	(17.0) 6	+9.87736	-0.1604	-0.66122	-1.29778
22	9.78809	0.4102	1.19981	1.04106	7	9.88052	0.1642	0.63137	1.29954
23	9.79074	0.4001	1.19592	1.05247	8	9.88321	0.1723	0.59918	1.30117
24	9.79369	0.3928	1.19006	1.06344	9	9.88528	0.1817	0.56430	1.30268
25	9.79665	0.3887	1.18491	1.07401	10	9.88672	0.1889	0.52624	1.30406
26	+9.79938	-0.3875	-1.17957	-1.08420	11	+9.88774	-0.1912	-0.48439	-1.30631
27	9.80174	0.3884	1.17405	1.09403	12	9.88856	0.1871	0.43795	1.30644
28	9.80362	0.3908	1.16833	1.10351	13	9.88955	0.1764	0.38580	1.30745
29	9.80502	0.3921	1.16241	1.11266	14	9.89091	0.1607	0.32641	1.30833
30	9.80602	0.3928	1.15629	1.12150	15	9.89281	0.1426	0.25744	1.30909
May 1	+9.80675	-0.3916	-1.14996	-1.13004	16	+9.89522	-0.1255	-0.17532	-1.30973
2	9.80729	0.3879	1.14341	1.13828	17	9.89802	0.1125	0.07374	1.31025
3	9.80790	0.3814	1.13664	1.14624	18	9.90096	0.1057	9.94082	1.31065
4	9.80874	0.3720	1.12963	1.15394	19	9.90384	0.1054	9.74814	1.31093
5	9.81000	0.3602	1.12239	1.16137	h 20	9.90644	0.1107	-9.39300	1.31108
h 6	+9.81188	-0.3471	-1.11491	-1.16855	(18.0) 21	+9.90871	-0.1193	+8.81701	-1.31112
(15.0) 7	9.81438	0.3343	1.10718	1.17550	22	9.91054	0.1289	9.57789	1.31103
8	9.81741	0.3235	1.09918	1.18221	23	9.91202	0.1375	9.83943	1.31082
9	9.82077	0.3167	1.09090	1.18869	24	9.91318	0.1435	0.00142	1.31050
10	9.82412	0.3145	1.08235	1.19495	25	9.91414	0.1458	0.11901	1.31005
11	+9.82713	-0.3164	-1.07350	-1.20100	26	+9.91501	-0.1436	+0.21136	-1.30948
12	9.82953	0.3208	1.06434	1.20684	27	9.91595	0.1371	0.28735	1.30879
13	9.83128	0.3252	1.05486	1.21248	28	9.91712	0.1264	0.35190	1.30798
14	9.83237	0.3272	1.04505	1.21793	29	9.91868	0.1125	0.40796	1.30705
15	9.83307	0.3251	1.03489	1.22318	30	9.92068	0.0975	0.45750	1.30600
16	+9.83374	-0.3179	-1.02437	-1.22825	July 1	+9.92315	-0.0845	+0.50185	-1.30482
17	+9.83469	-0.3062	-1.01346	-1.23314	2	+9.92600	-0.0766	+0.54198	-1.30352

E = +0°.04 = +0.008

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
July 1	+9.92315	-0.0845	+0.50185	-1.30482	Aug. 16	+9.99504	-0.2083	+1.18005	-1.08331
2	9.92600	0.0766	0.54198	1.30352	17	9.99566	0.2141	1.18531	1.07319
3	9.92898	0.0764	0.57860	1.30209	18	9.99605	0.2219	1.19039	1.06271
4	9.93190	0.0840	0.61226	1.30054	19	9.99630	0.2261	1.19529	1.05184
h 5	9.93448	0.0978	0.64338	1.29886	h 20	9.99654	0.2266	1.20002	1.04056
(19.0) 6	+9.93652	-0.1140	+0.67231	-1.29706	(23.0) 21	+9.99685	-0.2283	+1.20458	-1.02885
7	9.93800	0.1287	0.69932	1.29512	22	9.99738	0.2169	1.20897	1.01668
8	9.93902	0.1384	0.72464	1.29306	23	9.99822	0.2085	1.21319	1.00403
9	9.93976	0.1412	0.74846	1.29087	24	9.99844	0.2002	1.21728	0.99087
10	9.94053	0.1365	0.77092	1.28854	25	0.00102	0.1942	1.22116	0.97716
11	+9.94154	-0.1259	+0.79217	-1.28608	26	+0.00283	-0.1925	+1.22491	-0.96288
12	9.94298	0.1116	0.81231	1.28349	27	0.00473	0.1965	1.22851	0.94798
13	9.94487	0.0974	0.83146	1.28076	28	0.00652	0.2069	1.23196	0.93241
14	9.94714	0.0870	0.84967	1.27789	29	0.00799	0.2187	1.23525	0.91613
15	9.94962	0.0830	0.86705	1.27487	30	0.00904	0.2324	1.23840	0.89908
16	+9.95209	-0.0857	+0.88364	-1.27172	31	+0.00963	-0.2436	+1.24141	-0.88120
17	9.95436	0.0947	0.89951	1.26842	Sept. 1	0.00992	0.2502	1.24428	0.86241
18	9.95633	0.1077	0.91470	1.26497	2	0.01004	0.2510	1.24700	0.84263
19	9.95792	0.1220	0.92926	1.26138	3	0.01026	0.2461	1.24958	0.82177
20	9.95917	0.1357	0.94324	1.25763	h 4	0.01075	0.2367	1.25208	0.79971
h 21	+9.96011	-0.1467	+0.95667	-1.25372	(23.0) 5	+0.01162	-0.2258	+1.25434	-0.77682
(20.0) 22	9.96083	0.1542	0.96958	1.24966	6	0.01287	0.2149	1.25652	0.75146
23	9.96142	0.1575	0.98200	1.24544	7	0.01438	0.2077	1.25857	0.72494
24	9.96208	0.1563	0.99396	1.24106	8	0.01600	0.2055	1.26048	0.69654
25	9.96278	0.1510	1.00648	1.23650	9	0.01755	0.2084	1.26225	0.66600
26	+9.96382	-0.1425	+1.01658	-1.23178	10	+0.01888	-0.2154	+1.26390	-0.63299
27	9.96522	0.1324	1.02730	1.22688	11	0.01992	0.2245	1.26542	0.59711
28	9.96704	0.1234	1.08764	1.22180	12	0.02064	0.2338	1.26681	0.55784
29	9.96922	0.1181	1.04762	1.21654	13	0.02107	0.2417	1.26807	0.51449
30	9.97165	0.1190	1.05726	1.21109	14	0.02128	0.2471	1.26920	0.46616
31	+9.97406	-0.1270	+1.06658	-1.20545	15	+0.02133	-0.2492	+1.27020	-0.41160
Aug. 1	9.97625	0.1409	1.07558	1.19961	16	0.02135	0.2475	1.27108	0.34900
2	9.97802	0.1580	1.08428	1.19357	17	0.02142	0.2424	1.27183	0.27564
3	9.97932	0.1745	1.09270	1.18731	18	0.02167	0.2338	1.27245	0.18711
4	9.98013	0.1873	1.10084	1.18085	h 19	0.02219	0.2228	1.27294	0.07557
h 5	+9.98064	-0.1943	+1.10872	-1.17415	(0.0) 20	+0.02304	-0.2110	+1.27331	-0.92482
(21.0) 6	9.98105	0.1946	1.11633	1.16723	21	0.02423	0.2004	1.27356	9.69168
7	9.98162	0.1889	1.12370	1.16007	22	0.02571	0.1932	1.27367	-9.15193
8	9.98258	0.1791	1.13083	1.15266	23	0.02733	0.1912	1.27366	+9.31820
9	9.98386	0.1685	1.13773	1.14499	24	0.02890	0.1949	1.27352	9.74674
10	+9.98555	-0.1600	+1.14440	-1.13706	25	+0.03025	-0.2028	+1.27325	+9.95818
11	9.98747	0.1562	1.15085	1.12886	26	0.03124	0.2126	1.27286	0.09974
12	9.98944	0.1583	1.15710	1.12037	27	0.03181	0.2212	1.27234	0.20627
13	9.99128	0.1659	1.16313	1.11158	28	0.03204	0.2258	1.27169	0.29169
14	9.99286	0.1774	1.16897	1.10249	29	0.03209	0.2246	1.27091	0.36296
15	+9.99412	-0.1905	+1.17461	-1.09907	30	+0.03218	-0.2170	+1.27000	+0.42408
16	+9.99504	-0.2033	+1.18005	-1.08331	Oct. 1	+0.03250	-0.2039	+1.26896	+0.47758

E = +0".04 = +0.008

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+0.03250	-0.2039	+1.26896	+0.47758	Nov. 16	+0.07578	-9.5670	+1.03976	+1.22071
2	0.03316	0.1873	1.26778	0.52511	17	0.07765	9.5439	1.02892	1.22611
3	0.03423	0.1702	1.26648	0.56786	18	0.07941	9.5444	1.01765	1.23131
4	0.03560	0.1556	1.26504	0.60668	h 19	0.08095	9.5629	1.00594	1.23631
h 5	0.03715	0.1460	1.26347	0.64222	(4.0) 20	0.08211	9.5860	0.99377	1.24113
(1.0) 6	+0.03868	-0.1423	+1.26176	+0.67497	21	+0.08293	-9.6005	+0.98110	+1.24576
7	0.04005	0.1488	1.25991	0.70533	22	0.08349	9.5969	0.96790	1.25021
8	0.04115	0.1488	1.25793	0.73359	23	0.08395	9.5679	0.95415	1.25448
9	0.04196	0.1547	1.25580	0.76002	24	0.08451	9.5068	0.93981	1.25858
10	0.04248	0.1598	1.25354	0.78483	25	0.08534	9.4094	0.92483	1.26250
11	+0.04278	-0.1622	+1.25112	+0.80819	26	+0.08652	-9.2688	+0.90917	+1.26626
12	0.04292	0.1610	1.24857	0.83025	27	0.08806	9.0785	0.89278	1.26986
13	0.04301	0.1552	1.24586	0.85113	28	0.08986	8.8357	0.87559	1.27329
14	0.04313	0.1448	1.24301	0.87094	29	0.09178	8.5705	0.85755	1.27656
15	0.04340	0.1300	1.24000	0.88977	30	0.09364	8.4200	0.83859	1.27967
16	+0.04392	-0.1113	+1.23685	+0.90770	Dec. 1	+0.09532	-8.5079	+0.81860	+1.28262
17	0.04474	0.0904	1.23353	0.92481	2	0.09672	8.6739	0.79750	1.28542
18	0.04588	0.0695	1.23006	0.94115	3	0.09786	8.8089	0.77517	1.28807
19	0.04734	0.0519	1.22642	0.95678	4	0.09875	8.8837	0.75148	1.29057
h 20	0.04897	0.0404	1.22262	0.97175	h 5	0.09947	8.8998	0.72627	1.29292
(3.0) 21	+0.05063	-0.0667	+1.21865	+0.98610	(5.0) 6	+0.10007	-8.8451	+0.69935	+1.29512
22	0.05212	0.0402	1.21451	0.99987	7	0.10066	8.6712	0.67049	1.29718
23	0.05330	0.0479	1.21020	1.01309	8	0.10132	-8.0334	0.63942	1.29909
24	0.05410	0.0558	1.20571	1.02581	9	0.10214	+8.5515	0.60550	1.30086
25	0.05457	0.0592	1.20103	1.03804	10	0.10321	8.9455	0.56919	1.30248
26	+0.05481	-0.0552	+1.19617	+1.04981	11	+0.10455	+9.1495	+0.52905	+1.30396
27	0.05503	0.0416	1.19112	1.06114	12	0.10615	9.2725	0.48466	1.30530
28	0.05542	0.0187	1.18588	1.07207	13	0.10799	9.3408	0.43504	1.30650
29	0.05614	9.9884	1.18043	1.08260	14	0.10994	9.3653	0.37884	1.30756
30	0.05725	9.9543	1.17478	1.09277	15	0.11183	9.3506	0.31410	1.30849
31	+0.05871	-9.9216	+1.16891	+1.10257	16	+0.11353	+9.2997	+0.23782	+1.30927
Nov. 1	0.06038	9.8952	1.16283	1.11203	17	0.11491	9.2196	0.14504	1.30991
2	0.06213	9.8786	1.15652	1.12117	18	0.11597	9.1291	0.02671	1.31042
3	0.06376	9.8725	1.14999	1.13000	19	0.11672	9.0660	9.86332	1.31079
h 4	0.06516	9.8743	1.14321	1.13852	h 20	0.11730	9.0734	9.59804	1.31102
(3.0) 5	+0.06629	-9.8798	+1.13619	+1.14675	(6.0) 21	+0.11789	+9.1569	+8.79619	+1.31112
6	0.06712	9.8849	1.12891	1.15470	22	0.11869	9.2728	-9.43348	1.31107
7	0.06772	9.8861	1.12136	1.16239	23	0.11977	9.3820	9.78184	1.31089
8	0.06817	9.8810	1.11355	1.16981	24	0.12118	9.4669	9.97253	1.31058
9	0.06853	9.8681	1.10545	1.17698	25	0.12286	9.5224	0.10450	1.31012
10	+0.06892	-9.8460	+1.09705	+1.18391	26	+0.12469	+9.5483	-0.20546	+1.30953
11	0.06942	9.8142	1.08835	1.19060	27	0.12653	9.5479	0.28721	1.30880
12	0.07013	9.7722	1.07933	1.19706	28	0.12821	9.5240	0.35587	1.30792
13	0.07111	9.7215	1.06998	1.20329	29	0.12966	9.4817	0.41503	1.30691
14	0.07240	9.6654	1.06028	1.20931	30	0.13086	9.4278	0.46696	1.30576
15	+0.07398	-9.6108	+1.05021	+1.21511	31	+0.13179	+9.3707	-0.51322	+1.30447
16	+0.07578	-9.5670	+1.03976	+1.22071	32	+0.13252	+9.3232	-0.55491	+1.30304

E = +0°.04 = +0.003

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f		f'		g		h		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	'	h	m	°	'			"	
Jan.	0	0.0008	+1.009	-0.005	336 40.8	22 26.7	350 34.9	23 22.3	0.85244	1.31003	-1.45	-0.1612	
	1	0.0035	1.021	0.008	337 9.0	22 28.6	349 38.5	23 18.6	0.85427	1.30980	1.59	0.2019	
	2	0.0063	1.032	0.009	337 41.4	22 30.8	348 42.0	23 14.8	0.85704	1.30955	1.73	0.2390	
	3	0.0090	1.044	0.008	338 15.2	22 33.0	347 45.5	23 11.0	0.86093	1.30929	1.88	0.2730	
	4	0.0117	1.055	-0.004	338 44.7	22 35.0	346 48.9	23 7.3	0.86583	1.30900	2.02	0.3044	
	h (7.0)	5	0.0145	+1.067	+0.001	339 6.9	22 36.5	345 52.2	23 3.5	0.87140	1.30869	-2.16	-0.3336
	6	0.0172	1.078	0.006	339 20.3	22 37.4	344 55.4	22 59.7	0.87725	1.30837	2.30	0.3608	
	7	0.0199	1.089	0.010	339 25.6	22 37.7	343 58.6	22 55.9	0.88299	1.30803	2.43	0.3863	
	8	0.0227	1.100	0.012	339 24.2	22 37.6	343 1.7	22 52.1	0.88828	1.30766	2.57	0.4102	
	9	0.0254	1.111	0.012	339 18.5	22 37.2	342 4.7	22 48.3	0.89286	1.30728	2.71	0.4327	
	10	0.0282	+1.122	+0.010	339 11.0	22 36.7	341 7.5	22 44.5	0.89673	1.30688	-2.85	-0.4540	
	11	0.0309	1.133	+0.006	339 4.0	22 36.3	340 10.3	22 40.7	0.89978	1.30646	2.98	0.4742	
	12	0.0336	1.144	0.000	338 59.7	22 36.0	339 13.0	22 36.9	0.90206	1.30603	3.11	0.4933	
	13	0.0364	1.155	-0.006	339 0.9	22 36.1	338 15.5	22 33.0	0.90382	1.30558	3.25	0.5115	
	14	0.0391	1.166	0.011	339 8.7	22 36.6	337 18.0	22 29.2	0.90532	1.30512	3.38	0.5289	
	15	0.0419	+1.177	-0.016	339 23.6	22 37.6	336 20.3	22 25.4	0.90689	1.30464	-3.51	-0.5454	
	16	0.0446	1.187	0.018	339 44.5	22 39.0	335 22.4	22 21.5	0.90907	1.30414	3.64	0.5612	
	17	0.0473	1.198	0.017	340 9.9	22 40.7	334 24.5	22 17.6	0.91211	1.30362	3.77	0.5763	
	18	0.0501	1.208	0.013	340 34.4	22 42.3	333 26.4	22 13.8	0.91629	1.30310	3.90	0.5906	
	h (8.0)	19	0.0528	1.219	-0.007	340 54.4	22 43.6	332 28.2	22 9.9	0.92151	1.30256	4.02	0.6047
	20	0.0555	+1.229	+0.001	341 6.1	22 44.4	331 29.9	22 6.0	0.92741	1.30201	-4.15	-0.6180	
	21	0.0583	1.239	0.008	341 8.3	22 44.6	330 31.4	22 2.1	0.93344	1.30144	4.27	0.6308	
	22	0.0610	1.249	0.013	341 1.8	22 44.1	329 32.7	21 58.2	0.93897	1.30087	4.40	0.6430	
	23	0.0638	1.259	0.015	340 49.6	22 43.3	328 33.9	21 54.3	0.94362	1.30028	4.52	0.6548	
	24	0.0665	1.269	0.013	340 36.1	22 42.4	327 35.0	21 50.3	0.94705	1.29968	4.64	0.6662	
	25	0.0692	+1.279	+0.009	340 26.0	22 41.7	326 35.9	21 46.4	0.94934	1.29907	-4.75	-0.6771	
	26	0.0720	1.289	+0.003	340 22.8	22 41.5	325 36.7	21 42.5	0.95079	1.29846	4.87	0.6876	
	27	0.0747	1.299	-0.003	340 27.9	22 41.9	324 37.3	21 38.5	0.95186	1.29783	4.99	0.6978	
	28	0.0774	1.308	0.007	340 41.1	22 42.7	323 37.8	21 34.5	0.95303	1.29721	5.10	0.7075	
	29	0.0802	1.318	0.009	340 59.5	22 44.0	322 38.1	21 30.5	0.95479	1.29657	5.21	0.7170	
	30	0.0829	+1.327	-0.003	341 20.0	22 45.3	321 38.3	21 26.6	0.95738	1.29592	-5.32	-0.7260	
	31	0.0856	1.336	-0.004	341 38.0	22 46.5	320 38.2	21 22.6	0.96075	1.29528	5.43	0.7348	
	Feb. 1	0.0884	1.345	0.000	341 50.7	22 47.4	319 38.0	21 18.5	0.96472	1.29463	5.54	0.7432	
	2	0.0911	1.354	+0.005	341 57.0	22 47.8	318 37.8	21 14.5	0.96897	1.29396	5.64	0.7514	
	h (9.0)	3	0.0939	1.363	0.009	341 56.4	22 47.8	317 37.3	21 10.5	0.97313	1.29331	5.74	0.7592
	4	0.0966	+1.372	+0.012	341 50.7	22 47.4	316 36.6	21 6.4	0.97702	1.29265	-5.84	-0.7668	
	5	0.0993	1.381	0.013	341 41.1	22 46.7	315 35.9	21 2.4	0.98036	1.29198	5.94	0.7742	
	6	0.1021	1.390	0.011	341 29.8	22 46.0	314 34.9	20 58.3	0.98304	1.29132	6.04	0.7812	
	7	0.1048	1.398	0.008	341 19.0	22 45.3	313 33.8	20 54.3	0.98511	1.29067	6.14	0.7880	
	8	0.1076	1.407	+0.003	341 10.5	22 44.7	312 32.5	20 50.2	0.98656	1.29000	6.23	0.7946	
	9	0.1103	+1.415	-0.003	341 5.9	22 44.4	311 31.0	20 46.1	0.98750	1.28934	-6.32	-0.8010	
	10	0.1130	1.423	0.009	341 6.6	22 44.4	310 29.4	20 42.0	0.98817	1.28869	6.41	0.8071	
	11	0.1158	1.431	0.014	341 13.3	22 44.9	309 27.6	20 37.8	0.98879	1.28804	6.50	0.8130	
	12	0.1185	1.439	0.017	341 25.7	22 45.7	308 25.6	20 33.7	0.98975	1.28738	6.59	0.8186	
	13	0.1212	1.447	0.018	341 42.1	22 46.8	307 23.5	20 29.6	0.99138	1.28674	6.67	0.8241	
	14	0.1240	+1.455	-0.015	341 59.4	22 48.0	306 21.2	20 25.4	0.99386	1.28611	-6.75	-0.8294	
	15	0.1267	+1.463	-0.010	342 14.1	22 48.9	305 18.8	20 21.3	0.99722	1.28549	-6.83	-0.8344	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	$^{\circ}$ $'$	h m	$^{\circ}$ $'$	h m			$''$	
Feb. 15	0.1267	+1.463	-0.010	342 14.1	22 48.9	305 18.8	20 21.3	0.99722	1.28549	-6.83	-0.8344
16	0.1295	1.471	-0.003	342 23.3	22 49.6	304 16.1	20 17.1	1.00129	1.28487	6.91	0.8393
17	0.1322	1.478	+0.005	342 24.9	22 49.7	303 13.4	20 12.9	1.00557	1.28425	6.98	0.8440
h 18	0.1349	1.486	0.010	342 19.2	22 49.3	302 10.5	20 8.7	1.00970	1.28365	7.06	0.8485
(10.0) 19	0.1377	1.493	0.013	342 7.8	22 48.5	301 7.4	20 4.5	1.01314	1.28307	7.13	0.8528
20	0.1404	+1.501	+0.013	341 54.7	22 47.6	300 4.2	20 0.3	1.01569	1.28249	-7.20	-0.8570
21	0.1432	1.508	0.009	341 43.5	22 46.9	299 0.9	19 56.1	1.01726	1.28192	7.26	0.8610
22	0.1459	1.515	+0.004	341 37.4	22 46.5	297 57.4	19 51.8	1.01800	1.28137	7.32	0.8648
23	0.1486	1.522	-0.002	341 39.0	22 46.6	296 53.8	19 47.6	1.01831	1.28083	7.39	0.8684
24	0.1514	1.529	0.006	341 47.8	22 47.2	295 50.1	19 43.3	1.01864	1.28031	7.44	0.8718
25	0.1541	+1.536	-0.009	342 2.4	22 48.2	294 46.2	19 39.1	1.01932	1.27980	-7.50	-0.8751
26	0.1568	1.543	0.008	342 20.0	22 49.3	293 42.3	19 34.9	1.02073	1.27931	7.56	0.8783
27	0.1596	1.550	0.005	342 36.5	22 50.4	292 38.2	19 30.6	1.02282	1.27883	7.61	0.8813
28	0.1623	1.557	-0.001	342 49.5	22 51.3	291 34.1	19 26.3	1.02552	1.27837	7.66	0.8841
Mar. 1	0.1650	1.563	+0.004	342 56.9	22 51.8	290 29.8	19 22.0	1.02850	1.27794	7.71	0.8868
2	0.1678	+1.570	+0.009	342 58.6	22 51.9	289 25.4	19 17.7	1.03152	1.27752	-7.75	-0.8893
3	0.1705	1.576	0.012	342 55.3	22 51.7	288 21.0	19 13.4	1.03431	1.27711	7.79	0.8917
4	0.1733	1.583	0.013	342 48.7	22 51.2	287 16.5	19 9.1	1.03668	1.27674	7.83	0.8940
5	0.1760	1.589	0.012	342 40.2	22 50.7	286 11.9	19 4.8	1.03853	1.27638	7.87	0.8961
h 6	0.1787	1.596	0.010	342 31.9	22 50.1	285 7.2	19 0.5	1.03981	1.27603	7.91	0.8980
(11.0) 7	0.1815	+1.602	+0.005	342 25.3	22 49.7	284 2.5	18 56.2	1.04058	1.27572	-7.94	-0.8998
8	0.1842	1.608	-0.001	342 22.0	22 49.5	282 57.7	18 51.8	1.04089	1.27542	7.97	0.9015
9	0.1870	1.615	0.007	342 23.4	22 49.6	281 52.9	18 47.5	1.04091	1.27515	8.00	0.9030
10	0.1897	1.621	0.012	342 30.0	22 50.0	280 48.0	18 43.2	1.04088	1.27489	8.02	0.9044
11	0.1924	1.627	0.016	342 41.9	22 50.8	279 43.1	18 38.9	1.04105	1.27466	8.05	0.9057
12	0.1952	+1.633	-0.017	342 57.9	22 51.9	278 38.2	18 34.5	1.04170	1.27445	-8.07	-0.9068
13	0.1979	1.639	0.016	343 15.7	22 53.0	277 33.2	18 30.2	1.04309	1.27427	8.09	0.9078
14	0.2006	1.645	0.011	343 32.3	22 54.2	276 28.2	18 25.9	1.04526	1.27411	8.10	0.9086
15	0.2034	1.652	-0.005	343 44.7	22 55.0	275 23.2	18 21.5	1.04812	1.27398	8.12	0.9093
16	0.2061	1.658	+0.002	343 51.0	22 55.4	274 18.2	18 17.2	1.05132	1.27387	8.13	0.9099
17	0.2089	+1.664	+0.008	343 50.5	22 55.4	273 13.2	18 12.9	1.05451	1.27378	-8.14	-0.9104
18	0.2116	1.670	0.012	343 44.7	22 55.0	272 8.2	18 8.5	1.05726	1.27372	8.14	0.9107
19	0.2143	1.676	0.012	343 36.1	22 54.4	271 3.2	18 4.2	1.05929	1.27369	8.15	0.9109
20	0.2171	1.682	0.010	343 28.3	22 53.9	269 58.2	17 59.9	1.06043	1.27368	8.15	0.9110
h 21	0.2198	1.688	+0.005	343 24.8	22 53.7	268 53.2	17 55.5	1.06084	1.27369	8.14	0.9109
(12.0) 22	0.2226	+1.694	-0.001	343 27.7	22 53.8	267 48.4	17 51.2	1.06075	1.27373	-8.14	-0.9107
23	0.2253	1.700	0.006	343 37.8	22 54.5	266 43.6	17 46.9	1.06084	1.27379	8.14	0.9104
24	0.2280	1.706	0.009	343 54.0	22 55.6	265 38.8	17 42.6	1.06084	1.27387	8.13	0.9099
25	0.2308	1.712	0.009	344 13.5	22 56.9	264 34.1	17 38.3	1.06159	1.27399	8.12	0.9093
26	0.2335	1.718	0.007	344 33.3	22 58.2	263 29.5	17 34.0	1.06307	1.27412	8.10	0.9086
27	0.2362	+1.724	-0.003	344 50.4	22 59.4	262 25.0	17 29.7	1.06514	1.27428	-8.09	-0.9077
28	0.2390	1.730	+0.003	345 2.9	23 0.2	261 20.5	17 25.4	1.06760	1.27446	8.07	0.9067
29	0.2417	1.736	0.008	345 10.1	23 0.7	260 16.2	17 21.1	1.07017	1.27467	8.05	0.9056
30	0.2444	1.742	0.011	345 12.3	23 0.8	259 11.9	17 16.8	1.07253	1.27489	8.02	0.9044
31	0.2472	1.749	0.013	345 11.0	23 0.7	258 7.8	17 12.5	1.07461	1.27514	8.00	0.9030
Apr. 1	0.2499	+1.755	+0.013	345 7.7	23 0.5	257 3.8	17 8.3	1.07618	1.27541	-7.97	-0.9015
2	0.2527	+1.761	+0.011	345 4.3	23 0.3	255 59.9	17 4.0	1.07727	1.27570	-7.94	-0.8999

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	'	h	m	°	'	h	m		
Apr. 													

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
		y	s	s	$^{\circ}$ $'$	h m	$^{\circ}$ $'$	h m				$''$	
May	17	0.3759	+2.111	-0.009	351 35.7	23 26.4	211 5.4	14 4.4	1.14139	1.30048	-4.47	-0.6507	
	18	0.3786	2.121	0.011	351 54.0	23 27.6	210 9.8	14 0.7	1.14256	1.30104	4.36	0.6394	
	19	0.3814	2.130	0.010	352 14.0	23 28.9	209 14.4	13 57.0	1.14435	1.30158	4.24	0.6277	
	20	0.3841	2.140	0.007	352 32.0	23 30.1	208 19.1	13 53.3	1.14671	1.30211	4.13	0.6155	
	h 21	0.3868	2.150	-0.002	352 46.4	23 31.0	207 24.0	13 49.6	1.14949	1.30264	4.01	0.6029	
	(16.0) 22	0.3896	+2.160	+0.004	352 56.1	23 31.7	206 29.0	13 45.9	1.15248	1.30314	-3.89	-0.5897	
	23	0.3923	2.170	0.009	353 1.1	23 32.1	205 34.2	13 42.3	1.15536	1.30363	3.77	0.5760	
	24	0.3950	2.180	0.012	353 2.3	23 32.2	204 39.5	13 38.6	1.15799	1.30412	3.65	0.5618	
	25	0.3978	2.190	0.013	353 1.3	23 32.1	203 45.0	13 35.0	1.16026	1.30459	3.52	0.5469	
	26	0.4005	2.200	0.012	352 59.6	23 32.0	202 50.6	13 31.4	1.16207	1.30504	3.40	0.5314	
June	27	0.4033	+2.210	+0.009	352 58.5	23 31.9	201 56.4	13 27.8	1.16348	1.30549	-3.28	-0.5152	
	28	0.4060	2.220	+0.004	352 59.2	23 32.0	201 2.2	13 24.1	1.16458	1.30592	3.15	0.4983	
	29	0.4087	2.231	-0.001	353 2.6	23 32.2	200 8.2	13 20.5	1.16541	1.30633	3.02	0.4805	
	30	0.4115	2.241	0.007	353 9.5	23 32.6	199 14.3	13 17.0	1.16622	1.30673	2.90	0.4619	
	31	0.4142	2.252	0.012	353 19.9	23 33.3	198 20.5	13 13.4	1.16714	1.30710	2.77	0.4423	
	h 1	0.4169	+2.262	-0.015	353 33.3	23 34.2	197 26.9	13 9.8	1.16831	1.30748	-2.64	-0.4217	
	2	0.4197	2.273	0.016	353 48.8	23 35.3	196 33.4	13 6.2	1.16995	1.30783	2.51	0.3999	
	3	0.4224	2.283	0.015	354 4.2	23 36.3	195 39.9	13 2.7	1.17215	1.30816	2.38	0.3768	
	4	0.4252	2.294	0.010	354 17.7	23 37.2	194 46.6	12 59.1	1.17490	1.30848	2.25	0.3524	
	h 5	0.4279	2.305	-0.003	354 27.3	23 37.7	193 53.3	12 55.5	1.17805	1.30879	2.12	0.3263	
(17.0)	6	0.4306	+2.316	+0.004	354 32.0	23 38.1	193 0.1	12 52.0	1.18135	1.30906	-1.99	-0.2984	
	7	0.4334	2.326	0.010	354 31.5	23 38.0	192 7.0	12 48.5	1.18451	1.30932	1.86	0.2686	
	8	0.4361	2.337	0.014	354 27.4	23 37.8	191 14.0	12 44.9	1.18726	1.30957	1.72	0.2365	
	9	0.4388	2.348	0.014	354 21.7	23 37.4	190 21.1	12 41.4	1.18940	1.30980	1.59	0.2016	
	10	0.4416	2.359	0.011	354 17.2	23 37.1	189 28.2	12 37.9	1.19090	1.31002	1.46	0.1635	
	11	0.4443	+2.370	+0.006	354 16.2	23 37.1	188 35.3	12 34.4	1.19193	1.31021	-1.32	-0.1217	
	12	0.4471	2.381	-0.001	354 20.1	23 37.3	187 42.5	12 30.8	1.19270	1.31038	1.19	0.0752	
	13	0.4498	2.392	0.006	354 29.0	23 37.9	186 49.8	12 27.3	1.19358	1.31055	1.06	0.0231	
	14	0.4525	2.403	0.010	354 41.7	23 38.8	185 57.1	12 23.8	1.19478	1.31068	0.92	9.9637	
	15	0.4553	2.414	0.010	354 56.0	23 39.7	185 4.4	12 20.3	1.19652	1.31079	0.78	9.8947	
h	16	0.4580	+2.425	-0.008	355 9.3	23 40.6	184 11.8	12 16.8	1.19879	1.31090	-0.65	-9.8126	
	17	0.4608	2.436	-0.003	355 19.6	23 41.3	183 19.2	12 13.3	1.20147	1.31098	0.51	9.7110	
	18	0.4635	2.447	+0.002	355 25.8	23 41.7	182 26.6	12 9.8	1.20435	1.31105	0.38	9.5781	
	19	0.4662	2.458	0.007	355 27.8	23 41.9	181 34.1	12 6.3	1.20721	1.31109	0.24	9.3854	
	h 20	0.4690	2.469	0.011	355 25.9	23 41.7	180 41.5	12 2.8	1.20983	1.31111	-0.11	-9.0303	
	(18.0) 21	0.4717	+2.480	+0.013	355 22.1	23 41.5	179 49.0	11 59.3	1.21214	1.31112	+0.03	+8.4543	
	22	0.4744	2.491	0.013	355 17.1	23 41.1	178 56.5	11 55.8	1.21402	1.31111	0.16	9.2152	
	23	0.4772	2.502	0.010	355 12.5	23 40.8	178 3.9	11 52.3	1.21556	1.31107	0.30	9.4767	
	24	0.4799	2.513	+0.006	355 9.2	23 40.6	177 11.4	11 48.8	1.21675	1.31102	0.44	9.6387	
	25	0.4827	2.524	0.000	355 8.4	23 40.6	176 18.9	11 45.3	1.21772	1.31096	0.57	9.7563	
h	26	0.4854	+2.535	-0.006	355 10.4	23 40.7	175 26.3	11 41.8	1.21857	1.31086	+0.71	+9.8486	
	27	0.4881	2.546	0.011	355 15.3	23 41.0	174 33.8	11 38.3	1.21945	1.31075	0.84	9.9246	
	28	0.4909	2.557	0.015	355 22.9	23 41.5	173 41.2	11 34.7	1.22054	1.31062	0.98	9.9892	
	29	0.4936	2.568	0.017	355 32.6	23 42.2	172 48.6	11 31.2	1.22200	1.31048	1.11	0.0452	
	30	0.4963	2.579	0.016	355 42.8	23 42.9	171 55.9	11 27.7	1.22390	1.31032	1.24	0.0948	
	July 1	0.4991	+2.590	-0.012	355 51.7	23 43.4	171 3.3	11 24.2	1.22629	1.31013	+1.38	+0.1391	
	2	0.5018	+2.600	-0.006	355 57.8	23 43.9	170 10.6	11 20.7	1.22909	1.30994	+1.51	+0.1793	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	y	s		s		$^{\circ} \quad '$	$h \quad m$	$^{\circ} \quad '$	$h \quad m$			$''$	
July	1	0.4991	+2.590	-0.012		355 51.7	23 43.4	171 3.3	11 24.2	1.22629	1.31013	+1.38	+0.1891
	2	0.5018	2.600	-0.006		355 57.8	23 43.9	170 10.6	11 20.7	1.22909	1.30994	1.51	0.1793
	3	0.5046	2.611	+0.001		355 59.6	23 44.0	169 17.8	11 17.2	1.23205	1.30971	1.64	0.2159
	4	0.5073	2.622	0.007		355 57.0	23 43.8	168 24.9	11 13.7	1.23500	1.30948	1.78	0.2495
	5	0.5100	2.633	0.012		355 50.6	23 43.4	167 32.0	11 10.1	1.23763	1.30922	1.91	0.2807
h (19.0)	6	0.5128	+2.644	+0.014		355 42.4	23 42.8	166 39.1	11 6.6	1.23975	1.30896	+2.04	+0.3096
	7	0.5155	2.654	0.012		355 34.5	23 42.3	165 46.1	11 3.1	1.24131	1.30866	2.17	0.3366
	8	0.5182	2.665	0.008		355 29.1	23 41.9	164 53.0	10 59.6	1.24238	1.30835	2.30	0.3619
	9	0.5210	2.676	+0.002		355 27.9	23 41.9	163 59.8	10 56.0	1.24313	1.30804	2.43	0.3857
	10	0.5237	2.686	-0.004		355 31.2	23 42.1	163 6.5	10 52.4	1.24387	1.30769	2.56	0.4082
	11	0.5265	+2.697	-0.008		355 38.3	23 42.6	162 13.2	10 48.9	1.24481	1.30733	+2.69	+0.4294
	12	0.5292	2.707	0.010		355 47.6	23 43.2	161 19.7	10 45.3	1.24616	1.30697	2.82	0.4496
	13	0.5319	2.717	0.008		355 56.7	23 43.8	160 26.1	10 41.7	1.24797	1.30659	2.94	0.4687
	14	0.5347	2.728	-0.004		356 3.7	23 44.2	159 32.5	10 38.2	1.25017	1.30619	3.07	0.4869
	15	0.5374	2.738	+0.001		356 7.3	23 44.5	158 38.7	10 34.6	1.25263	1.30577	3.19	0.5043
	16	0.5402	+2.748	+0.006		356 7.1	23 44.5	157 44.8	10 31.0	1.25510	1.30533	+3.32	+0.5209
	17	0.5429	2.758	0.011		356 3.5	23 44.2	156 50.8	10 27.4	1.25740	1.30489	3.44	0.5368
	18	0.5456	2.769	0.013		355 57.4	23 43.8	155 56.6	10 23.8	1.25943	1.30443	3.56	0.5520
	19	0.5484	2.779	0.013		355 50.2	23 43.3	155 2.4	10 20.2	1.26108	1.30397	3.68	0.5665
	20	0.5511	2.789	0.011		355 43.0	23 42.9	154 8.0	10 16.5	1.26239	1.30348	3.81	0.5805
h (20.0)	21	0.5538	+2.798	+0.007		355 37.0	23 42.5	153 13.5	10 12.9	1.26339	1.30298	+3.93	+0.5939
	22	0.5566	2.808	+0.002		355 32.9	23 42.2	152 18.8	10 9.3	1.26415	1.30247	4.05	0.6069
	23	0.5593	2.818	-0.004		355 31.2	23 42.1	151 24.0	10 5.6	1.26476	1.30195	4.16	0.6193
	24	0.5621	2.828	0.009		355 32.3	23 42.2	150 29.1	10 1.9	1.26536	1.30142	4.28	0.6312
	25	0.5648	2.837	0.014		355 36.0	23 42.4	149 34.0	9 58.3	1.26607	1.30088	4.39	0.6428
	26	0.5675	+2.847	-0.017		355 41.7	23 42.8	148 38.8	9 54.6	1.26705	1.30034	+4.51	+0.6539
	27	0.5703	2.856	0.017		355 48.5	23 43.2	147 43.5	9 50.9	1.26840	1.29977	4.62	0.6646
	28	0.5730	2.866	0.015		355 54.6	23 43.6	146 48.0	9 47.2	1.27015	1.29920	4.73	0.6749
	29	0.5757	2.875	0.010		355 58.8	23 43.9	145 52.3	9 43.5	1.27230	1.29862	4.84	0.6849
	30	0.5785	2.884	-0.003		355 59.6	23 44.0	144 56.5	9 39.8	1.27472	1.29803	4.95	0.6945
	31	0.5812	+2.893	+0.004		355 56.5	23 43.8	144 0.5	9 36.0	1.27716	1.29745	+5.06	+0.7039
Aug.	1	0.5840	2.902	0.010		355 49.9	23 43.3	143 4.3	9 32.3	1.27942	1.29685	5.16	0.7129
	2	0.5867	2.911	0.013		355 40.9	23 42.7	142 8.1	9 28.5	1.28126	1.29624	5.27	0.7216
	3	0.5894	2.920	0.013		355 31.7	23 42.1	141 11.5	9 24.8	1.28265	1.29563	5.37	0.7300
	4	0.5922	2.929	0.009		355 24.2	23 41.6	140 14.9	9 21.0	1.28354	1.29502	5.47	0.7381
h (21.0)	5	0.5949	+2.938	+0.004		355 20.1	23 41.3	139 18.0	9 17.2	1.28409	1.29440	+5.57	+0.7460
	6	0.5976	2.946	-0.002		355 20.2	23 41.3	138 21.0	9 13.4	1.28450	1.29378	5.67	0.7536
	7	0.6004	2.955	0.007		355 24.2	23 41.6	137 23.8	9 9.6	1.28503	1.29315	5.77	0.7610
	8	0.6031	2.963	0.009		355 30.9	23 42.1	136 26.4	9 5.8	1.28588	1.29253	5.86	0.7681
	9	0.6059	2.972	0.008		355 38.1	23 42.5	135 28.7	9 1.9	1.28713	1.29191	5.96	0.7750
	10	0.6086	+2.980	-0.005		355 44.2	23 42.9	134 31.0	8 58.1	1.28877	1.29123	+6.05	+0.7817
	11	0.6113	2.988	0.000		355 47.5	23 43.2	133 33.0	8 54.2	1.29066	1.29065	6.14	0.7881
	12	0.6141	2.996	+0.005		355 47.5	23 43.2	132 34.8	8 50.3	1.29263	1.29003	6.23	0.7944
	13	0.6168	3.004	0.010		355 44.1	23 42.9	131 36.4	8 46.4	1.29450	1.28940	6.32	0.8004
	14	0.6196	3.012	0.013		355 38.2	23 42.5	130 37.9	8 42.5	1.29613	1.28878	6.40	0.8062
	15	0.6223	+3.020	+0.014		355 31.0	23 42.1	129 39.1	8 38.6	1.29746	1.28815	+6.48	+0.8119
	16	0.6250	+3.028	+0.013		355 23.6	23 41.6	128 40.2	8 34.7	1.29845	1.28753	+6.57	+0.8173

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	r	f		f'		g		H		Log g .	Log h .	i	Log i .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	y	s		s		$^{\circ}$ $'$	h m	$^{\circ}$ $'$	h m			$''$	
Aug. 16	0.6250	+3.028	+0.013	355 23.6	23 41.6	128 40.2	8 34.7	1.29845	1.28753	+6.57	+0.8173		
17	0.6278	3.036	0.009	355 17.1	23 41.1	127 41.1	8 30.7	1.29914	1.28692	6.65	0.8226		
18	0.6305	3.043	+0.005	355 12.2	23 40.8	126 41.8	8 26.8	1.29959	1.28632	6.72	0.8277		
19	0.6332	3.051	-0.001	355 9.6	23 40.6	125 42.3	8 22.8	1.29966	1.28572	6.80	0.8326		
h 20	0.6360	3.058	0.007	355 9.4	23 40.6	124 42.6	8 18.8	1.30011	1.28512	6.88	0.8373		
(22.0) 21	0.6387	+3.066	-0.012	355 11.8	23 40.8	123 42.7	8 14.8	1.30039	1.28454	+6.95	+0.8419		
22	0.6414	3.073	0.016	355 16.4	23 41.1	122 42.6	8 10.8	1.30087	1.28396	7.02	0.8462		
23	0.6442	3.080	0.017	355 22.3	23 41.5	121 42.4	8 6.8	1.30165	1.28339	7.09	0.8505		
24	0.6469	3.087	0.016	355 28.3	23 41.9	120 42.0	8 2.8	1.30281	1.28283	7.15	0.8545		
25	0.6497	3.094	0.012	355 33.0	23 42.2	119 41.4	7 58.8	1.30433	1.28228	7.22	0.8584		
26	0.6524	+3.101	-0.006	355 35.1	23 42.3	118 40.7	7 54.7	1.30613	1.28175	+7.28	+0.8622		
27	0.6551	3.108	+0.001	355 33.8	23 42.2	117 39.7	7 50.6	1.30804	1.28122	7.34	0.8658		
28	0.6579	3.115	0.007	355 29.2	23 41.9	116 38.6	7 46.6	1.30988	1.28071	7.40	0.8692		
29	0.6606	3.122	0.011	355 22.0	23 41.5	115 37.3	7 42.5	1.31142	1.28020	7.46	0.8725		
30	0.6634	3.129	0.012	355 13.9	23 40.9	114 35.9	7 38.4	1.31255	1.27972	7.51	0.8757		
31	0.6661	+3.135	+0.009	355 6.8	23 40.5	113 34.3	7 34.3	1.31322	1.27925	+7.56	+0.8787		
Sept. 1	0.6688	3.142	+0.005	355 2.6	23 40.2	112 32.5	7 30.2	1.31355	1.27879	7.61	0.8816		
2	0.6716	3.148	-0.001	355 2.1	23 40.1	111 30.6	7 26.0	1.31363	1.27835	7.66	0.8843		
3	0.6743	3.155	0.006	355 5.6	23 40.4	110 28.6	7 21.9	1.31386	1.27793	7.71	0.8869		
h 4	0.6770	3.161	0.009	355 12.1	23 40.8	109 26.4	7 17.8	1.31429	1.27752	7.75	0.8893		
(23.0) 5	0.6798	+3.168	-0.009	355 20.1	23 41.3	108 24.0	7 13.6	1.31507	1.27713	+7.79	+0.8916		
6	0.6825	3.174	0.006	355 27.5	23 41.8	107 21.4	7 9.4	1.31624	1.27676	7.83	0.8938		
7	0.6853	3.180	-0.001	355 32.9	23 42.2	106 18.8	7 5.3	1.31770	1.27641	7.87	0.8958		
8	0.6880	3.186	+0.004	355 35.1	23 42.3	105 16.0	7 1.1	1.31930	1.27608	7.90	0.8978		
9	0.6907	3.193	0.010	355 34.4	23 42.3	104 13.1	6 56.9	1.32086	1.27576	7.94	0.8995		
10	0.6935	+3.199	+0.013	355 30.9	23 42.1	103 10.0	6 52.7	1.32222	1.27547	+7.97	+0.9012		
11	0.6962	3.205	0.015	355 25.9	23 41.9	102 6.8	6 48.5	1.32331	1.27520	7.99	0.9027		
12	0.6990	3.211	0.014	355 20.4	23 41.4	101 3.5	6 44.2	1.32409	1.27495	8.02	0.9041		
13	0.7017	3.217	0.011	355 15.6	23 41.0	100 0.1	6 40.0	1.32456	1.27472	8.04	0.9053		
14	0.7044	3.223	0.007	355 12.2	23 40.8	98 56.6	6 35.8	1.32482	1.27451	8.06	0.9065		
15	0.7072	+3.229	+0.001	355 10.9	23 40.7	97 53.1	6 31.5	1.32488	1.27432	+8.08	+0.9075		
16	0.7099	3.235	-0.005	355 12.0	23 40.8	96 49.4	6 27.3	1.32489	1.27417	8.10	0.9084		
17	0.7126	3.241	0.010	355 15.4	23 41.0	95 45.6	6 23.0	1.32492	1.27403	8.11	0.9091		
18	0.7154	3.247	0.014	355 21.1	23 41.4	94 41.8	6 18.8	1.32511	1.27391	8.12	0.9097		
h 19	0.7181	3.252	0.016	355 28.4	23 41.9	93 37.9	6 14.5	1.32556	1.27381	8.13	0.9102		
(0.0) 20	0.7208	+3.258	-0.016	355 36.2	23 42.4	92 34.0	6 10.3	1.32633	1.27375	+8.14	+0.9106		
21	0.7236	3.264	0.013	355 43.2	23 42.9	91 30.0	6 6.0	1.32745	1.27371	8.14	0.9108		
22	0.7263	3.270	0.007	355 48.2	23 43.2	90 26.0	6 1.7	1.32889	1.27368	8.14	0.9109		
23	0.7291	3.276	-0.001	355 50.3	23 43.4	89 22.0	5 57.5	1.33049	1.27369	8.14	0.9109		
24	0.7318	3.282	+0.005	355 49.1	23 43.3	88 17.8	5 53.2	1.33207	1.27371	8.14	0.9108		
25	0.7345	+3.288	+0.009	355 45.3	23 43.0	87 13.7	5 48.9	1.33346	1.27376	+8.14	+0.9105		
26	0.7373	3.294	0.011	355 40.1	23 42.7	86 9.6	5 44.6	1.33449	1.27383	8.13	0.9101		
27	0.7400	3.300	0.009	355 35.3	23 42.4	85 5.4	5 40.4	1.33511	1.27394	8.12	0.9096		
28	0.7428	3.305	+0.005	355 32.6	23 42.2	84 1.3	5 36.1	1.33536	1.27406	8.11	0.9090		
29	0.7455	3.311	0.000	355 33.4	23 42.2	82 57.2	5 31.8	1.33541	1.27421	8.10	0.9082		
30	0.7482	+3.317	-0.006	355 38.0	23 42.5	81 53.1	5 27.5	1.33545	1.27437	+8.08	+0.9073		
Oct. 1	0.7510	+3.323	-0.009	355 46.0	23 43.1	80 49.0	5 23.3	1.33570	1.27456	+8.06	+0.9062		

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H		Log g .	Log h .	i	Log i .
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	$^{\circ} \quad '$	$h \quad m$	$^{\circ} \quad '$	$h \quad m$				
Oct.	1	0.7510	+3.323	-0.009	355 46.0	23 43.1	80 49.0	5 23.3	1.33570	1.27456	+8.06	+0.9062
	2	0.7537	3.329	0.010	355 55.8	23 43.7	79 44.9	5 19.0	1.33626	1.27477	8.04	0.9050
	3	0.7564	3.335	0.008	356 5.8	23 44.4	78 40.9	5 14.7	1.33725	1.27501	8.01	0.9037
	4	0.7592	3.341	-0.004	356 14.2	23 44.9	77 36.9	5 10.5	1.33855	1.27527	7.99	0.9023
	5	0.7619	3.347	+0.002	356 20.0	23 45.3	76 32.9	5 6.2	1.34005	1.27556	7.96	0.9007
	6	0.7647	+3.353	+0.008	356 22.7	23 45.5	75 28.9	5 1.9	1.34156	1.27585	+7.93	+0.8990
	7	0.7674	3.360	0.013	356 22.5	23 45.5	74 25.0	4 57.7	1.34293	1.27618	7.89	0.8972
	8	0.7701	3.366	0.015	356 20.6	23 45.4	73 21.2	4 53.4	1.34404	1.27652	7.86	0.8952
	9	0.7729	3.372	0.015	356 18.0	23 45.2	72 17.5	4 49.2	1.34488	1.27688	7.82	0.8931
	10	0.7756	3.378	0.013	356 15.6	23 45.0	71 13.8	4 44.9	1.34541	1.27727	7.78	0.8908
h (1.0)	11	0.7784	+3.385	+0.009	356 14.6	23 45.0	70 10.1	4 40.7	1.34572	1.27768	+7.73	+0.8884
	12	0.7811	3.391	+0.003	356 15.3	23 45.0	69 6.6	4 36.4	1.34586	1.27810	7.69	0.8858
	13	0.7838	3.397	-0.002	356 18.3	23 45.2	68 3.1	4 32.2	1.34593	1.27853	7.64	0.8831
	14	0.7866	3.404	0.008	356 23.5	23 45.6	66 59.8	4 28.0	1.34600	1.27899	7.59	0.8803
	15	0.7893	3.410	0.012	356 30.9	23 46.1	65 56.5	4 23.8	1.34621	1.27947	7.54	0.8773
	16	0.7920	+3.417	-0.015	356 39.9	23 46.7	64 53.4	4 19.6	1.34667	1.27997	+7.48	+0.8741
	17	0.7948	3.424	0.015	356 49.7	23 47.3	63 50.3	4 15.4	1.34741	1.28047	7.43	0.8708
	18	0.7975	3.431	0.013	356 59.1	23 47.9	62 47.4	4 11.2	1.34849	1.28099	7.37	0.8673
	19	0.8003	3.438	0.008	357 6.9	23 48.5	61 44.6	4 7.0	1.34989	1.28153	7.31	0.8637
	20	0.8030	3.444	-0.002	357 12.0	23 48.8	60 41.9	4 2.8	1.35150	1.28208	7.24	0.8599
h (2.0)	21	0.8057	+3.451	+0.004	357 14.0	23 48.9	59 39.3	3 58.6	1.35315	1.28264	+7.18	+0.8559
	22	0.8085	3.458	0.009	357 13.3	23 48.9	58 36.9	3 54.5	1.35464	1.28321	7.11	0.8518
	23	0.8112	3.466	0.011	357 10.7	23 48.7	57 34.7	3 50.3	1.35583	1.28379	7.04	0.8475
	24	0.8139	3.473	0.010	357 8.0	23 48.5	56 32.5	3 46.2	1.35665	1.28439	6.97	0.8430
	25	0.8167	3.480	0.006	357 6.8	23 48.5	55 30.4	3 42.0	1.35713	1.28500	6.89	0.8383
	26	0.8194	+3.487	+0.001	357 8.5	23 48.6	54 28.6	3 37.9	1.35736	1.28561	+6.81	+0.8334
	27	0.8222	3.495	-0.005	357 13.9	23 48.9	53 26.9	3 33.8	1.35755	1.28623	6.74	0.8284
	28	0.8249	3.503	0.009	357 22.5	23 49.5	52 25.4	3 29.7	1.35788	1.28686	6.66	0.8232
	29	0.8276	3.510	0.011	357 33.4	23 50.2	51 24.0	3 25.6	1.35855	1.28749	6.57	0.8177
	30	0.8304	3.518	0.010	357 44.8	23 51.0	50 22.7	3 21.5	1.35959	1.28813	6.49	0.8121
Nov.	31	0.8331	+3.526	-0.006	357 55.0	23 51.7	49 21.5	3 17.4	1.36101	1.28878	+6.40	+0.8062
	1	0.8358	3.534	0.000	358 2.8	23 52.2	48 20.6	3 13.4	1.36264	1.28942	6.31	0.8001
	2	0.8386	3.542	+0.006	358 7.7	23 52.5	47 19.8	3 9.3	1.36437	1.29007	6.22	0.7938
	3	0.8413	3.550	0.011	358 9.6	23 52.6	46 19.1	3 5.3	1.36599	1.29074	6.13	0.7873
	4	0.8441	3.558	0.014	358 9.5	23 52.6	45 18.6	3 1.2	1.36739	1.29139	6.03	0.7805
	5	0.8468	+3.567	+0.015	358 8.4	23 52.6	44 18.2	2 57.2	1.36853	1.29205	+5.94	+0.7735
	6	0.8495	3.575	0.014	358 7.3	23 52.5	43 18.0	2 53.2	1.36936	1.29270	5.84	0.7662
	7	0.8523	3.584	0.010	358 7.2	23 52.5	42 17.9	2 49.2	1.36996	1.29336	5.74	0.7586
	8	0.8550	3.592	+0.005	358 8.6	23 52.6	41 18.0	2 45.2	1.37041	1.29402	5.63	0.7508
	9	0.8577	3.601	-0.001	358 11.9	23 52.8	40 18.2	2 41.2	1.37075	1.29466	5.53	0.7427
h (3.0)	10	0.8605	+3.610	-0.006	358 17.4	23 53.2	39 18.5	2 37.2	1.37112	1.29531	+5.42	+0.7343
	11	0.8632	3.619	0.011	358 24.7	23 53.6	38 19.0	2 33.3	1.37160	1.29595	5.32	0.7256
	12	0.8660	3.628	0.014	358 33.7	23 54.2	37 19.7	2 29.3	1.37228	1.29659	5.21	0.7166
	13	0.8687	3.637	0.015	358 43.3	23 54.9	36 20.5	2 25.4	1.37323	1.29722	5.10	0.7073
	14	0.8714	3.646	0.013	358 52.8	23 55.5	35 21.4	2 21.4	1.37449	1.29785	4.98	0.6976
	15	0.8742	+3.655	-0.009	359 1.0	23 56.1	34 22.5	2 17.5	1.37605	1.29846	+4.87	+0.6875
	16	0.8769	+3.665	-0.004	359 6.9	23 56.5	33 23.7	2 13.6	1.37784	1.29908	+4.75	+0.6770
	17	0.8797	3.673	0.000	359 12.8	23 56.9	32 24.9	2 9.7	1.37905	1.29969	4.64	0.6667
	18	0.8825	3.681	+0.003	359 18.7	23 57.3	31 26.1	2 5.8	1.38026	1.30030	4.53	0.6563
	19	0.8853	3.689	0.006	359 24.6	23 57.7	30 27.3	1 51.9	1.38147	1.30091	4.42	0.6459

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	γ	α	δ	ϵ	ζ	η	θ	ι	κ			λ	
Nov. 16	0.8769	+3.665	-0.004	359 6.9	23 56.5	33 23.7	2 13.6	1.37784	1.29908	+4.75	+0.6770		
17	0.8797	3.674	+0.003	359 9.8	23 56.7	32 25.1	2 9.7	1.37972	1.29909	4.64	0.6662		
18	0.8824	3.684	0.008	359 10.0	23 56.7	31 26.6	2 5.8	1.38147	1.30028	4.52	0.6549		
h 19	0.8851	3.693	0.011	359 8.0	23 56.5	30 28.2	2 1.9	1.38301	1.30086	4.40	0.6432		
(4.0) 20	0.8879	3.703	0.011	359 5.3	23 56.4	29 30.0	1 58.0	1.38418	1.30143	4.28	0.6310		
21	0.8906	+3.713	+0.008	359 3.5	23 56.2	28 31.9	1 54.1	1.38500	1.30199	+4.15	+0.6184		
22	0.8933	3.723	+0.003	359 4.1	23 56.3	27 33.9	1 50.3	1.38556	1.30254	4.03	0.6052		
23	0.8961	3.733	-0.003	359 7.7	23 56.5	26 36.1	1 46.4	1.38601	1.30308	3.90	0.5914		
24	0.8988	3.743	0.008	359 14.7	23 57.0	25 38.4	1 42.6	1.38656	1.30360	3.78	0.5771		
25	0.9016	3.753	0.011	359 23.8	23 57.6	24 40.9	1 38.7	1.38737	1.30410	3.65	0.5621		
26	0.9043	+3.764	-0.011	359 33.9	23 58.3	23 43.4	1 34.9	1.38854	1.30460	+3.52	+0.5464		
27	0.9070	3.774	0.008	359 43.2	23 58.9	22 46.0	1 31.1	1.39008	1.30509	3.39	0.5300		
28	0.9098	3.785	-0.003	359 50.4	23 59.4	21 48.7	1 27.2	1.39187	1.30555	3.26	0.5129		
29	0.9125	3.795	+0.003	359 54.8	23 59.7	20 51.6	1 23.4	1.39379	1.30600	3.13	0.4948		
30	0.9152	3.806	0.009	359 56.4	23 59.8	19 54.6	1 19.6	1.39565	1.30643	2.99	0.4759		
Dec. 1	0.9180	+3.816	+0.013	359 55.6	23 59.7	18 57.6	1 15.8	1.39733	1.30684	+2.86	+0.4559		
2	0.9207	3.827	0.015	359 53.5	23 59.6	18 0.7	1 12.0	1.39873	1.30724	2.72	0.4348		
3	0.9235	3.838	0.014	359 51.2	23 59.4	17 3.9	1 8.3	1.39987	1.30763	2.59	0.4124		
4	0.9262	3.849	0.011	359 49.5	23 59.3	16 7.2	1 4.5	1.40076	1.30799	2.45	0.3888		
h 5	0.9289	3.860	0.007	359 49.2	23 59.3	15 10.5	1 0.7	1.40148	1.30834	2.31	0.3635		
(5.0) 6	0.9317	+3.871	+0.001	359 50.5	23 59.4	14 14.0	0 56.9	1.40208	1.30866	+2.17	+0.3366		
7	0.9344	3.882	-0.005	359 53.5	23 59.6	13 17.5	0 53.2	1.40267	1.30897	2.03	0.3078		
8	0.9371	3.893	0.010	359 58.5	23 59.9	12 21.0	0 49.4	1.40333	1.30926	1.89	0.2767		
9	0.9399	3.904	0.014	0 4.8	0 0.3	11 24.6	0 45.6	1.40416	1.30953	1.75	0.2431		
10	0.9426	3.915	0.015	0 11.9	0 0.8	10 28.2	0 41.9	1.40522	1.30977	1.61	0.2065		
11	0.9454	+3.926	-0.014	0 19.0	0 1.3	9 31.9	0 38.1	1.40657	1.31000	+1.47	+0.1663		
12	0.9481	3.937	0.011	0 25.2	0 1.7	8 35.7	0 34.4	1.40817	1.31020	1.32	0.1219		
13	0.9508	3.948	-0.006	0 29.3	0 2.0	7 39.4	0 30.6	1.41002	1.31039	1.18	0.0723		
14	0.9536	3.960	+0.001	0 30.9	0 2.1	6 43.2	0 26.9	1.41197	1.31055	1.04	0.0161		
15	0.9563	3.971	0.007	0 29.7	0 2.0	5 47.1	0 23.1	1.41386	1.31070	0.89	9.9514		
16	0.9591	+3.982	+0.011	0 26.3	0 1.8	4 50.9	0 19.4	1.41555	1.31083	+0.75	+9.8751		
17	0.9618	3.994	0.012	0 21.8	0 1.5	3 54.8	0 15.7	1.41693	1.31093	0.61	9.7823		
18	0.9645	4.005	0.011	0 17.7	0 1.2	2 58.7	0 11.9	1.41799	1.31101	0.46	9.6640		
19	0.9673	4.016	+0.006	0 15.3	0 1.0	2 2.6	0 8.2	1.41873	1.31107	0.32	9.5006		
h 20	0.9700	4.028	0.000	0 15.5	0 1.0	1 6.6	0 4.4	1.41931	1.31110	0.17	9.2353		
(6.0) 21	0.9727	+4.039	-0.006	0 18.8	0 1.3	0 10.5	0 0.7	1.41991	1.31112	+0.03	+8.4335		
22	0.9755	4.051	0.010	0 24.5	0 1.6	359 14.4	23 57.0	1.42071	1.31111	-0.12	-9.0708		
23	0.9782	4.062	0.011	0 31.4	0 2.1	358 18.4	23 53.2	1.42160	1.31108	0.26	9.4191		
24	0.9810	4.073	0.009	0 38.0	0 2.5	357 22.3	23 49.5	1.42322	1.31104	0.41	9.6098		
25	0.9837	4.085	-0.005	0 43.0	0 2.9	356 26.2	23 45.7	1.42490	1.31096	0.55	9.7418		
26	0.9864	+4.096	+0.001	0 45.5	0 3.0	355 30.0	23 42.0	1.42673	1.31087	-0.70	-9.8427		
27	0.9892	4.108	0.007	0 45.3	0 3.0	354 33.9	23 38.3	1.42857	1.31076	0.84	9.9245		
28	0.9919	4.119	0.012	0 42.7	0 2.8	353 37.7	23 34.5	1.43025	1.31061	0.98	9.9931		
29	0.9946	4.130	0.014	0 38.6	0 2.6	352 41.4	23 30.8	1.43170	1.31045	1.13	0.0523		
30	0.9974	4.142	0.014	0 34.0	0 2.3	351 45.2	23 27.0	1.43289	1.31027	1.27	0.1042		
31	1.0001	+4.153	+0.012	0 29.7	0 2.0	350 48.8	23 23.3	1.43382	1.31007	-1.41	-0.1505		
32	1.0029	+4.164	+0.008	0 26.6	0 1.8	349 52.4	23 19.5	1.43454	1.30985	-1.56	-0.1922		

214 BESSELIAN AND INDEPENDENT STAR-NUMBERS, 1917.

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A ₁ .	Log B ₁ .	Log C.	Log D.	f	G ₁	H	Log g ₁ .	Log h.	Log d.
Jan. 0.72	+9.5166	-0.4382	-0.5332	+1.3038	+1.012	337 23	350 22	0.8534	1.8100	-0.1705
10.69	9.5625	0.4415	0.8208	1.2823	1.125	839 19	340 56	0.8934	1.3068	0.4580
20.67	9.6017	0.4529	0.9828	1.2451	1.231	340 30	331 20	0.9294	1.3019	0.6202
30.64	9.6348	0.4689	1.0900	1.1894	1.328	341 12	321 30	0.9606	1.2958	0.7273
Feb. 9.61	9.6627	0.4856	1.1644	1.1097	1.416	341 39	311 24	0.9874	1.2893	0.8017
19.58	+9.6860	-0.4998	-1.2159	+0.9953	+1.494	342 0	301 2	1.0098	1.2830	-0.8532
Mar. 1.56	9.7059	0.5086	1.2497	0.8209	1.564	342 26	290 26	1.0286	1.2779	0.8870
11.53	9.7232	0.5101	1.2684	+0.5006	1.627	343 1	279 41	1.0446	1.2746	0.9057
21.50	9.7391	0.5031	1.2736	-9.5615	1.688	343 50	268 53	1.0586	1.2737	0.9109
31.48	9.7545	0.4867	1.2658	0.5874	1.749	344 56	258 9	1.0717	1.2751	0.9030
Apr. 10.45	+9.7702	-0.4609	-1.2447	-0.8594	+1.812	346 15	247 37	1.0848	1.2787	-0.8819
20.42	9.7866	0.4257	1.2092	1.0160	1.882	347 44	237 21	1.0986	1.2839	0.8464
30.39	9.8040	0.3822	1.1570	1.1206	1.959	349 18	227 24	1.1136	1.2900	0.7943
May 10.37	9.8226	0.3317	1.0835	1.1941	2.045	350 51	217 47	1.1302	1.2963	0.7208
20.34	9.8421	0.2771	0.9802	1.2460	2.138	352 16	208 28	1.1481	1.3020	0.6175
30.31	+9.8621	-0.2223	-0.8282	-1.2813	+2.239	353 29	199 25	1.1669	1.3067	-0.4655
June 9.28	9.8823	0.1727	0.5722	1.3024	2.346	354 26	190 33	1.1864	1.3097	0.2095
19.26	9.9021	0.1343	-9.8035	1.3109	2.455	355 8	181 47	1.2057	1.3111	-9.4409
29.23	9.9211	0.1123	+0.3936	1.3073	2.565	355 34	173 3	1.2244	1.3105	+0.0309
July 9.20	9.9389	0.1087	0.7416	1.2915	2.672	355 47	164 16	1.2421	1.3081	0.3788
19.17	+9.9554	-0.1213	+0.9246	-1.2626	+2.775	355 49	155 20	1.2586	1.3041	+0.5618
29.15	9.9702	0.1451	1.0442	1.2184	2.872	355 44	146 12	1.2734	1.2988	0.6814
Aug. 8.12	9.9834	0.1734	1.1282	1.1555	2.959	355 35	136 48	1.2867	1.2928	0.7654
18.09	9.9950	0.2000	1.1884	1.0671	3.040	355 26	127 6	1.2984	1.2866	0.8257
28.07	0.0051	0.2202	1.2304	0.9393	3.112	355 19	117 6	1.3086	1.2809	0.8677
Sept. 7.04	+0.0142	-0.2300	+1.2577	-0.7374	+3.177	355 19	106 48	1.3177	1.2766	+0.8949
17.01	0.0224	0.2264	1.2714	-0.3131	3.238	355 26	96 17	1.3258	1.2741	0.9088
26.98	0.0302	0.2065	1.2726	+0.1547	3.297	355 43	85 39	1.3334	1.2739	0.9099
Oct. 6.96	0.0380	0.1671	1.2609	0.6891	3.357	356 9	75 0	1.3410	1.2760	0.8982
16.93	0.0462	0.1044	1.2355	0.9152	3.421	356 44	64 26	1.3489	1.2802	0.8727
26.90	+0.0551	-0.0117	+1.1942	+1.0544	+3.491	357 25	54 4	1.3575	1.2859	+0.8314
Nov. 5.87	0.0648	9.8779	1.1335	1.1498	3.570	358 9	43 56	1.3670	1.2923	0.7708
15.85	0.0755	9.6790	1.0466	1.2171	3.658	358 51	34 2	1.3776	1.2987	0.6839
25.82	0.0870	-9.3388	0.9199	1.2637	3.757	359 29	24 22	1.3890	1.3048	0.5572
Dec. 5.79	0.0991	+6.7782	0.7187	1.2936	3.863	0 0	14 54	1.4011	1.3084	0.3559
15.77	+0.1114	+9.2087	+0.2951	+1.3087	+3.974	0 21	5 32	1.4134	1.3107	+9.9324
25.74	0.1237	9.4072	-0.1308	1.3100	4.088	0 33	356 13	1.4257	1.3109	-9.7680
35.71	+0.1354	+9.4473	-0.6660	+1.2975	+4.200	0 35	346 51	1.4374	1.3090	-0.3034

E = +0.003

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 316 to 513, from the mean places, given on pages 217 to 230. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

TERMS OF SHORT PERIOD IN THE NUTATION, 1917. 215

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
Jan. 0	-0.08	+0.08	Feb. 15	-0.16	-0.09	Apr. 1	+0.22	+0.01	May 17	-0.14	+0.06
1	0.14	+0.04	16	-0.04	0.10	2	0.18	0.04	18	0.18	+0.02
2	0.15	-0.01	17	+0.08	0.07	3	0.11	0.07	19	0.17	-0.03
3	0.12	0.05	18	0.17	-0.05	4	+0.03	0.09	20	0.11	0.07
4	-0.06	0.08	19	0.22	0.00	5	-0.07	0.09	21	-0.03	0.09
5	+0.02	-0.09	20	+0.21	+0.05	6	-0.16	+0.07	22	+0.06	-0.09
6	0.10	0.09	21	0.15	0.09	7	0.23	+0.04	23	0.14	0.08
7	0.16	0.07	22	+0.07	0.10	8	0.27	0.00	24	0.20	0.05
8	0.19	-0.03	23	-0.03	0.09	9	0.25	-0.04	25	0.22	-0.02
9	0.19	0.00	24	0.11	+0.06	10	0.20	0.07	26	0.20	+0.02
10	+0.16	+0.04	25	-0.14	+0.02	11	-0.10	-0.09	27	+0.15	+0.05
11	0.10	0.07	26	0.13	-0.03	12	+0.01	0.09	28	+0.07	0.08
12	+0.01	0.09	27	0.09	0.07	13	0.11	0.07	29	-0.02	0.09
13	-0.09	0.09	28	-0.01	0.09	14	0.19	-0.03	30	0.12	0.08
14	0.19	0.08	Mar. 1	+0.07	0.09	15	0.21	+0.02	31	0.20	0.06
15	-0.26	+0.05	2	+0.15	-0.08	16	+0.18	+0.06	June 1	-0.25	+0.03
16	0.30	+0.01	3	0.20	0.05	17	+0.10	0.09	2	0.27	-0.01
17	0.28	-0.04	4	0.22	-0.02	18	0.00	0.10	3	0.24	0.05
18	0.22	0.07	5	0.20	+0.02	19	-0.09	0.08	4	0.16	0.08
19	-0.11	0.10	6	0.16	0.05	20	0.15	+0.05	5	-0.05	0.10
20	+0.01	-0.10	7	+0.08	+0.08	21	-0.18	0.00	6	+0.06	-0.09
21	0.13	0.07	8	-0.01	0.09	22	0.14	-0.04	7	0.16	0.06
22	0.21	-0.03	9	0.11	0.08	23	-0.08	0.08	8	0.22	-0.01
23	0.24	+0.02	10	0.20	0.07	24	+0.01	0.09	9	0.23	+0.03
24	0.22	0.06	11	0.26	+0.03	25	0.10	0.09	10	0.18	0.08
25	+0.15	+0.09	12	-0.28	-0.01	26	+0.17	-0.07	11	+0.09	+0.10
26	+0.05	0.10	13	0.26	0.05	27	0.21	-0.04	12	-0.01	0.10
27	-0.05	0.09	14	0.19	0.08	28	0.22	0.00	13	0.10	0.07
28	0.12	+0.05	15	-0.08	0.10	29	0.19	+0.03	14	0.16	+0.03
29	0.14	0.00	16	+0.03	0.09	30	0.13	0.06	15	0.17	-0.01
30	-0.13	-0.04	17	+0.14	-0.06	May 1	+0.05	+0.08	16	-0.13	-0.06
31	-0.07	0.07	18	0.20	-0.01	2	-0.04	0.09	17	-0.06	0.06
Feb. 1	+0.01	0.09	19	0.20	+0.04	3	0.14	0.08	18	+0.03	0.09
2	0.09	0.09	20	0.16	0.08	4	0.21	0.05	19	0.12	0.09
3	0.15	0.07	21	+0.08	0.10	5	0.26	+0.02	20	0.18	0.06
4	+0.20	-0.04	22	-0.02	+0.10	6	-0.26	-0.02	21	+0.21	-0.03
5	0.21	-0.01	23	0.10	0.07	7	0.21	0.06	22	0.21	+0.01
6	0.18	+0.03	24	0.15	+0.03	8	0.13	0.09	23	0.17	0.05
7	0.13	0.06	25	0.16	-0.01	9	-0.01	0.10	24	0.10	0.07
8	+0.05	0.08	26	0.11	0.05	10	+0.10	0.08	25	+0.01	0.09
9	-0.05	+0.09	27	-0.04	-0.08	11	+0.18	-0.04	26	-0.09	+0.08
10	0.15	0.08	28	+0.05	0.09	12	0.22	0.00	27	0.18	0.07
11	0.23	0.06	29	0.13	0.09	13	0.21	+0.05	28	0.25	+0.04
12	0.29	+0.02	30	0.19	0.06	14	0.14	0.09	29	0.28	0.00
13	0.29	-0.02	31	0.22	-0.03	15	+0.04	0.10	30	0.27	-0.04
14	-0.25	-0.06	Apr. 1	+0.22	+0.01	16	-0.06	+0.09	July 1	-0.20	-0.07
15	-0.16	-0.09	2	+0.18	+0.04	17	-0.14	+0.06	2	-0.11	-0.09

216 TERMS OF SHORT PERIOD IN THE NUTATION, 1917.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$	Date.	$\delta''\phi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 1	-0.20	-0.07	Aug. 16	+0.21	+0.03	Oct. 1	-0.15	+0.05	Nov. 16	-0.06	-0.09
2	-0.11	0.09	17	0.15	0.06	2	0.17	0.00	17	+0.04	0.08
3	+0.01	0.09	18	+0.08	0.08	3	0.13	-0.04	18	0.13	0.06
4	0.12	0.07	19	-0.02	0.09	4	-0.06	0.08	19	0.18	-0.01
5	0.20	-0.03	20	0.12	0.08	5	+0.04	0.09	20	0.19	+0.03
6	+0.23	+0.02	21	-0.20	+0.06	6	+0.13	-0.09	21	+0.14	+0.07
7	0.20	0.06	22	0.26	+0.03	7	0.21	0.07	22	+0.06	0.09
8	0.13	0.09	23	0.28	-0.01	8	0.24	-0.03	23	-0.05	0.09
9	+0.03	0.10	24	0.26	0.05	9	0.24	0.00	24	0.13	0.07
10	-0.06	0.08	25	0.19	0.08	10	0.21	+0.04	25	0.18	+0.03
11	-0.13	+0.05	26	-0.09	-0.09	11	+0.14	+0.07	26	-0.18	-0.02
12	0.16	0.00	27	+0.02	0.08	12	+0.06	0.08	27	0.14	0.06
13	0.13	-0.04	28	0.11	0.06	13	-0.04	0.08	28	-0.05	0.09
14	-0.07	0.08	29	0.18	-0.01	14	0.13	0.07	29	+0.05	0.09
15	+0.01	0.09	30	0.19	+0.03	15	0.20	0.05	30	0.15	0.08
16	+0.10	-0.09	31	+0.15	+0.07	16	-0.25	+0.01	Dec. 1	+0.21	-0.06
17	0.17	0.07	Sept. 1	+0.08	0.10	17	0.25	-0.03	2	0.24	-0.02
18	0.21	-0.04	2	-0.02	0.10	18	0.21	0.06	3	0.23	+0.02
19	0.22	0.00	3	0.10	0.07	19	0.14	0.09	4	0.18	0.05
20	0.19	+0.04	4	0.14	+0.03	20	-0.04	0.09	5	0.11	0.07
21	+0.12	+0.06	5	-0.14	-0.02	21	+0.06	-0.08	6	+0.01	+0.08
22	+0.04	0.08	6	0.10	0.06	22	0.14	-0.04	7	-0.08	0.08
23	-0.06	0.09	7	-0.02	0.09	23	0.18	0.00	8	0.16	0.06
24	0.15	0.07	8	+0.07	0.09	24	0.16	+0.05	9	0.22	+0.03
25	0.23	0.05	9	0.16	0.08	25	0.11	0.08	10	0.25	0.00
26	-0.28	+0.01	10	+0.22	-0.06	26	+0.01	+0.10	11	-0.24	-0.04
27	0.28	-0.03	11	0.24	-0.02	27	-0.08	0.09	12	0.18	0.07
28	0.24	0.06	12	0.23	+0.02	28	0.15	0.06	13	-0.10	0.09
29	0.16	0.09	13	0.18	0.05	29	0.18	+0.02	14	+0.01	0.09
30	-0.05	0.09	14	0.11	0.07	30	0.16	-0.03	15	0.11	0.07
31	+0.07	-0.08	15	+0.02	+0.06	31	-0.10	-0.07	16	+0.18	-0.03
Aug. 1	0.16	-0.04	16	-0.08	0.08	Nov. 1	-0.01	0.09	17	0.20	+0.02
2	0.21	0.00	17	0.16	0.07	2	+0.09	0.09	18	0.17	0.06
3	0.21	+0.05	18	0.23	+0.04	3	0.18	0.08	19	+0.10	0.09
4	0.15	0.08	19	0.26	0.00	4	0.23	0.04	20	0.00	0.10
5	+0.06	+0.10	20	-0.26	-0.04	5	+0.25	-0.01	21	-0.09	+0.08
6	-0.03	0.09	21	0.21	0.07	6	0.22	+0.03	22	0.16	+0.05
7	0.11	0.06	22	0.12	0.09	7	0.17	0.06	23	0.18	0.00
8	0.15	+0.02	23	-0.02	0.09	8	+0.08	0.08	24	0.15	-0.05
9	0.13	-0.03	24	+0.08	0.07	9	-0.01	0.08	25	-0.08	0.08
10	-0.08	-0.07	25	+0.15	-0.03	10	-0.10	+0.08	26	+0.02	-0.09
11	0.00	0.09	26	0.18	+0.02	11	0.18	0.05	27	0.11	0.09
12	+0.09	0.09	27	0.15	0.06	12	0.23	+0.02	28	0.19	0.07
13	0.17	0.08	28	+0.08	0.09	13	0.25	-0.02	29	0.23	-0.03
14	0.22	0.05	29	-0.01	0.10	14	0.22	0.05	30	0.23	+0.01
15	+0.23	-0.01	30	-0.09	+0.08	15	-0.16	-0.08	31	+0.20	+0.04
16	+0.21	+0.03	Oct. 1	-0.15	+0.05	16	-0.06	-0.09	32	+0.13	+0.07

MEAN PLACES OF TEN-DAY STARS, 1917. 217

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
33 Piscium	4.7	K0	0 1 5.255	+3.0714	-0.0006	- 6 10 18.77	+20.136	+0.091
α Andromedæ (<i>Alpheratz</i>)	2.2	A0p	0 4 5.642	3.0964	+0.0107	+28 37 55.99	19.880	-0.163
β Cassiopeie	2.4	F5	0 4 44.428	3.1361	+0.0680	+58 41 31.28	19.861	-0.180
ε Phœnicis	3.9	K0	0 5 12.088	3.0506	+0.0096	-46 12 19.72	19.848	-0.193
22 Andromedæ	5.1	F0	0 6 0.119	3.1105	+0.0021	+45 36 37.45	20.084	-0.004
γ Pegasi	2.9	B2	0 8 57.593	+3.0867	+0.0003	+14 43 19.85	+20.020	-0.010
δ Andromedæ	4.5	A2	0 13 59.251	3.1281	-0.0044	+36 19 30.33	19.961	-0.047
ζ Ceti	3.8	K0	0 15 11.958	3.0569	-0.0013	- 9 17 2.18	19.972	-0.030
ζ Tucanæ	4.3	F8	0 15 45.483	3.1464	+0.2739	-65 21 43.94	21.170	+1.172
44 Piscium	6.0	G5	0 21 8.836	3.0744	-0.0014	+ 1 28 48.19	19.937	-0.023
β Hydri	2.9	G0	0 21 24.623	+3.1971	+0.6972	-77 43 18.09	+20.276	+0.318
α Phœnicis	2.4	K0	0 22 11.117	2.9720	+0.0188	-42 45 24.20	19.548	-0.403
12 Ceti	6.0	K5	0 25 48.196	3.0622	+0.0011	- 4 24 56.65	19.918	0.000
13 Ceti	5.2	G0	0 30 58.516	3.0872	+0.0273	- 4 2 58.34	19.846	-0.017
ζ Cassiopeie	3.7	B2	0 32 20.390	3.3298	+0.0036	+53 26 25.07	19.839	-0.007
π Andromedæ	4.4	B3	0 32 26.620	+3.1962	+0.0019	+33 15 45.46	+19.845	0.000
ε Andromedæ	4.5	G5	0 34 9.953	3.1649	-0.0172	+28 51 40.54	19.569	-0.254
δ Andromedæ	3.5	K0	0 34 53.148	3.2026	+0.0110	+30 24 24.57	19.717	-0.097
α Cassiopeie (<i>Schedir</i>)	var.	K0	0 35 47.272	3.3880	+0.0063	+56 4 56.41	19.770	-0.032
μ Phœnicis	4.6	K0	0 37 24.283	2.8389	-0.0046	-46 32 27.18	19.747	-0.032
β Ceti	2.2	K0	0 39 25.444	+3.0124	+0.0160	-18 26 30.85	+19.791	+0.041
ο Cassiopeie	4.7	B2	0 40 5.617	3.3322	+0.0028	+47 49 49.29	19.733	-0.006
21 Cassiopeie	5.6	A2	0 40 8.510	3.9063	-0.0080	+74 32 4.64	19.712	-0.026
ζ Andromedæ	4.3	K0	0 42 56.147	3.1752	-0.0073	+23 48 57.14	19.616	-0.078
η Cassiopeie	3.6	F8	0 44 4.191	3.6149	+0.1432	+57 22 35.55	19.200	-0.476
δ Piscium	4.6	K5	0 44 22.471	+3.1103	+0.0055	+ 7 8 0.98	+19.627	-0.044
λ Hydri	5.0	K5	0 45 43.258	2.1003	+0.0425	-75 22 29.58	19.647	-0.001
20 Ceti	4.9	K0	0 48 45.876	3.0643	-0.0005	- 1 35 40.46	19.590	-0.008
γ Cassiopeie	2.2	B0p	0 51 41.231	3.5964	+0.0036	+60 16 3.24	19.533	-0.005
μ Andromedæ	3.9	A2	0 52 8.460	3.3217	+0.0132	+38 2 57.80	19.559	+0.030
α Sculptoris	4.4	B5	0 54 36.870	+2.8902	-0.0018	-29 48 21.70	+19.466	-0.013
ε Piscium	4.4	K0	0 58 38.030	3.1114	-0.0054	+ 7 26 36.74	19.419	+0.026
β Phœnicis	3.4	K0	1 2 22.806	2.6795	-0.0067	-47 9 48.05	19.284	-0.024
μ Cassiopeie	5.3	G5	1 2 44.206	3.9711	+0.3918	+54 30 49.74	17.744	-1.555
η Ceti	3.6	K0	1 4 24.862	3.0175	+0.0148	-10 37 18.66	19.134	-0.125
β Andromedæ	2.4	Ma	1 5 4.762	+3.3514	+0.0148	+35 10 50.85	+19.126	-0.117
τ Piscium	4.7	K0	1 7 5.091	3.2977	+0.0056	+29 38 57.55	19.164	-0.029
ζ Piscium	5.6	A5	1 9 23.597	3.1321	+0.0096	+ 7 8 12.37	19.061	-0.032
κ Tucanæ	5.0	F8	1 12 57.309	2.0392	+0.0744	-69 19 1.27	19.127	+0.089
ψ Piscium	5.3	A2	1 13 30.988	3.0927	-0.0033	+ 3 10 39.65	18.997	-0.024
υ Piscium	4.7	A2	1 14 54.019	+3.2913	+0.0016	+26 49 41.37	+18.976	-0.008
θ Ceti	3.8	K0	1 19 52.444	2.9978	-0.0057	- 8 36 40.68	18.626	-0.215
δ Cassiopeie	2.8	A5	1 20 22.443	3.9022	+0.0407	+59 48 16.27	18.788	-0.037
γ Phœnicis	3.4	K5	1 24 45.714	2.6074	-0.0029	-43 44 36.23	18.465	-0.225
38 Cassiopeie	6.0	F5	1 25 1.814	4.4185	+0.0263	+69 50 16.94	18.609	-0.072
η Piscium	3.7	G5	1 27 2.336	+3.2061	+0.0015	+14 55 6.06	+18.614	-0.003
40 Cassiopeie	5.5	K0	1 31 51.309	4.7370	-0.0011	+72 37 8.69	18.455	-0.002
υ Andromedæ	4.2	G0	1 31 55.147	3.6107	-0.0153	+40 59 26.87	18.078	-0.377
π Piscium	5.6	F0	1 32 41.751	3.1768	-0.0049	+11 43 2.35	18.462	+0.034
υ Persei	3.8	K0	1 32 53.356	3.6686	+0.0064	+48 12 29.27	18.302	-0.119
α Eridani (<i>Achernar</i>)	0.6	B5	1 34 37.452	+2.2361	+0.0103	-57 39 29.67	+18.320	-0.041
ω Cassiopeie	5.5	A0p	1 36 10.410	4.4041	+0.0088	+67 37 25.81	18.304	-0.002
ν Piscium	4.7	K0	1 37 6.617	3.1199	-0.0015	+ 5 4 4.95	18.276	+0.003
φ Persei	4.2	B0p	1 38 26.963	3.7454	+0.0031	+50 16 16.10	18.208	-0.015
τ Ceti	3.6	K0	1 40 12.695	2.7866	-0.1198	-16 22 26.83	19.018	+0.859
ο Piscium	4.5	K0	1 41 0.516	+3.1652	+0.0049	+ 8 44 25.46	+18.175	+0.045
ε Sculptoris	5.4	F0	1 41 45.290	+2.8044	+0.0052	- 25 28 0.82	+18.051	-0.051

13 Ceti, dup. 5^m.5, 6^m.2, 0["].3
α Cassiop., var. irreg. 2^m.2, 2^m.8
η Cassiop. comp. 7^m.6, 4["] a. pr.

β Phœnicis, dup. 4^m.1, 4^m.1, 1["]
ζ Piscium, star 6^m.5, 24["] n. f.

κ Tucanæ, comp. 7^m.6, 6["] n.
ε Sculptoris, comp. 6^m.5, 5["] n. f.

218 MEAN PLACES OF TEN-DAY STARS, 1917.

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
ζ Ceti	3.9	K0	1 47 21.784	+2.9601	+0.020	-10 44 40.43	+17.850	-0.027
α Trianguli	3.6	F5	1 48 20.746	3.4138	+0.015	+29 10 30.12	17.616	-0.231
ε Cassiopeiae	3.4	B3	1 48 24.487	4.2864	+0.053	+63 15 43.20	17.830	-0.615
ξ Piscium	4.8	K0	1 49 15.422	3.1039	+0.015	+2 46 41.75	17.831	+0.021
β Arietis	2.7	A5	1 50 8.057	3.3087	+0.004	+20 24 10.04	17.668	-0.111
ψ Phoenicis	4.4	Mb	1 50 19.001	+2.4035	-0.024	-46 42 32.87	+17.068	-0.104
ν Ceti	4.2	K5	1 56 5.618	2.8357	+0.082	-21 28 46.13	17.520	-0.006
α Hydri	3.0	F0	1 56 8.844	1.8818	+0.077	-61 58 24.38	17.552	+0.026
50 Cassiopeiae	4.1	A0	1 56 19.026	5.0648	-0.002	+72 1 13.50	17.539	+0.020
γ Andromedae pr.	2.3	K0	1 58 47.863	3.6720	+0.046	+41 55 55.46	17.362	-0.051
γ Andromedae seq.	5.1	A	Δα +0.842	.....	.....	Δδ +4.58	.....	.....
α Arietis	2.2	K2	2 2 29.429	+3.3765	+0.019	+23 4 13.99	+17.106	-0.144
β Trianguli	3.1	A5	2 4 35.965	3.5621	+0.026	+34 35 42.98	17.111	-0.044
55 Cassiopeiae	6.2	F5	2 7 56.952	4.6709	-0.020	+66 8 10.27	16.999	-0.002
6 Persei	5.4	K0	2 8 4.556	3.9746	+0.068	+50 40 51.26	16.820	-0.167
ξ Ceti	4.5	G5	2 8 35.910	+3.1772	-0.012	+8 27 28.09	+16.956	-0.016
μ Fornacis	5.2	A0	2 9 14.907	2.6378	-0.037	-31 6 47.04	16.919	-0.022
γ Trianguli	4.1	A0	2 12 22.490	3.5590	+0.040	+33 27 50.23	16.742	-0.052
67 Ceti	5.7	G5	2 12 50.533	2.9907	+0.054	-6 48 15.03	16.661	-0.110
φ Eridani	3.8	B8	2 13 32.555	2.1411	+0.062	-51 53 45.88	16.709	-0.020
ο Ceti (Mira)	† var.	Md	2 15 9.150	+3.0202	+0.002	-3 21 13.83	+16.431	-0.220
κ Fornacis	5.4	F5	2 18 44.646	2.7448	+0.018	-24 11 35.30	16.406	-0.077
δ Hydri	4.3	A2	2 20 16.017	1.0589	-0.097	-69 2 12.48	16.427	+0.020
ι Cassiopeiae	† 4.6	A5p	2 22 12.509	4.9066	-0.003	+67 1 48.50	16.319	+0.010
ξ Ceti	4.3	A0	2 23 44.617	3.1867	+0.025	+8 5 19.19	16.223	-0.007
σ Ceti	4.8	F5	2 28 9.116	+2.8415	-0.063	-15 36 29.45	+15.899	-0.102
36 H. Cassiopeiae	5.3	K0	2 30 6.628	5.6424	-0.052	+72 27 22.70	15.914	+0.017
ν Ceti	5.0	G5	2 31 30.967	+3.1463	-0.025	+5 13 54.36	15.894	-0.018
μ Hydri	5.3	K0	2 33 23.719	-1.8462	+0.046	-79 28 18.11	15.683	-0.038
ν Arietis	5.4	A2	2 34 6.008	+3.4024	+0.001	+21 36 11.29	15.661	-0.021
δ Ceti	4.0	B2	2 35 13.607	+3.0783	+0.011	-0 1 43.75	+15.626	+0.004
ε Hydri	4.3	B9	2 38 18.462	0.9145	+0.019	-68 37 20.74	15.456	+0.005
θ Persei	4.2	G0	2 38 31.361	4.0843	+0.053	+48 52 41.76	15.351	-0.087
γ Ceti seq.	† 3.7	A0	2 38 59.876	3.1061	-0.096	+2 53 11.96	15.261	-0.151
π Ceti	4.4	B5	2 40 10.269	2.8538	-0.012	-14 12 34.51	15.335	-0.012
μ Ceti	4.4	A5	2 40 27.153	+3.2396	+0.018	+9 45 52.09	+15.305	-0.025
γ Persei	† 3.9	K0	2 44 37.944	4.3589	+0.041	+55 33 7.10	15.080	-0.012
41 Arietis	3.7	B8	2 45 5.632	3.5253	+0.050	+26 55 9.16	14.954	-0.111
β Fornacis	4.5	K0	2 45 37.016	2.5121	+0.080	-32 45 14.56	15.190	+0.156
σ Arietis	5.5	B5	2 46 54.428	3.3063	+0.016	+14 44 26.31	14.926	-0.034
τ ² Eridani	4.8	K0	2 47 16.333	+2.7200	-0.044	-21 20 43.61	+14.922	-0.017
τ Persei	4.1	G0p	2 48 21.811	4.2376	+0.008	+52 25 25.44	14.872	-0.008
η Eridani	4.0	K0	2 52 22.329	2.8304	+0.060	-9 13 40.10	14.424	-0.213
ε Arietis (mean)	† 4.6	A2	2 54 27.735	3.4258	-0.009	+21 0 32.67	14.508	-0.010
47 H. Cephei	5.7	Ma	2 54 59.610	7.8578	-0.002	+79 5 32.52	14.490	+0.010
θ Eridani	† 3.4	A2	2 55 6.964	+2.2767	-0.025	-40 38 12.34	+14.497	+0.024
α Ceti	2.8	Ma	2 57 56.323	3.1334	-0.009	+3 45 53.30	14.223	-0.078
τ ³ Eridani	4.2	A3	2 58 43.945	2.6449	-0.004	-23 56 56.75	14.209	-0.044
γ Persei	3.1	G0p	2 58 46.536	4.3292	+0.010	+53 10 56.74	14.246	-0.004
ρ Persei	† var.	Mb	2 59 51.117	3.8359	+0.016	+38 31 9.94	14.068	-0.115
μ Horologii	5.2	F0	3 1 39.177	+1.4079	-0.028	-60 3 32.87	+14.018	-0.054
θ Hydri	5.5	B8	3 2 4.324	0.1016	+0.034	-72 13 35.69	14.059	+0.014
β Persei (Algol)	† var.	B8	3 2 45.724	3.8941	+0.008	+40 38 12.42	14.000	-0.002
δ Arietis	4.5	K0	3 6 52.788	3.4205	+0.010	+19 24 49.19	13.743	+0.001
12 Eridani	† 4.0	F8	3 8 32.655	2.5468	+0.041	-29 18 49.45	14.273	+0.636
48 H. Cephei	5.5	F0	3 9 44.362	+7.5077	+0.024	+77 25 53.42	+13.504	-0.055
ξ Arietis	5.0	A0	3 10 7.630	+8.4440	-0.019	+20 44 15.26	+13.452	-0.062

ο Ceti, var., 331^d, 1^m.7-9^m.6, star 9^m.8^s
 ε Cassiopeiae, triple, 7^m, 8^m, 2^m, 8^m
 γ Ceti, comp. 6^m.2, 2^m.7 pr.

γ Persei, star 8^m.5, 28^m n. pr.
 ε Arietis, dup., 5^m.2, 5^m.6, 1^m.2
 θ Eridani, comp. 4^m.4, 1^m.8^m

ρ Persei, var. irreg., 3^m.4-4^m.2
 β Persei, var. 2^d.8^m, 2^m.1-3^m.2
 12 Eridani, comp. 7^m, 1^m.4 n. pr.

MEAN PLACES OF TEN-DAY STARS, 1917. 219

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ^{''}	^{''}	^{''}
38 G. Horologii	5.7	N	3 10 26.798	+1.5150	-.0006	-57 37 55.60	+13.508	-0.006
ζ Eridani	4.9	A3	3 11 48.028	2.9125	-.0006	- 9 7 38.13	13.479	+0.063
τ Arietis	5.2	B3	3 16 25.929	3.4597	+0.0023	+20 50 54.99	13.089	-0.033
ε Eridani	4.3	G5	3 16 36.756	+2.3980	+0.2808	-43 23 11.60	13.867	+0.767
ι Hydri	5.5	F2	3 18 0.035	-1.5497	+0.0852	-77 41 31.67	13.068	+0.040
α Persei	1.9	F5	3 18 23.335	+4.3780	+0.0080	+49 34 0.45	+12.964	-0.028
ο Tauri	3.8	G5	3 20 20.663	3.2266	-.0046	+ 8 44 15.33	12.788	-0.074
2 H. Camelopardalis	4.4	A0	3 22 20.239	4.8387	+0.0027	+59 39 8.13	12.729	+0.001
ξ Tauri	3.8	B8	3 22 40.128	3.2486	+0.0040	+ 9 26 38.30	12.659	-0.046
ζ Tauri	4.3	K0	3 26 17.304	3.3093	+0.0016	+12 39 11.11	12.461	+0.002
ε Eridani	3.8	K0p	3 29 1.141	+2.3233	-.0660	- 9 44 18.21	+12.297	+0.027
τ Eridani	4.3	B5	3 30 7.202	2.6484	+0.0023	-21 54 38.44	12.155	-0.039
δ Persei	3.1	B5	3 37 0.504	4.2608	+0.0035	+47 31 23.67	11.674	-0.086
δ Eridani	3.7	K0	3 39 16.294	2.8731	-.0061	-10 2 37.56	12.280	+0.731
ν Persei	3.9	F5	3 39 32.977	4.0675	-.0004	+42 19 2.94	11.530	0.000
5 H. Camelopardalis	4.7	A0	3 41 34.461	+6.2872	+0.0069	+71 4 40.54	+11.328	-0.067
η Tauri (<i>Alcyone</i>)	3.0	B5	3 42 32.843	3.5619	+0.0016	+23 50 57.71	11.265	-0.050
τ Eridani	4.3	F8	3 43 16.595	2.5807	-.0115	-23 29 36.69	10.780	-0.481
γ Eridani	4.2	K0	3 46 20.924	+2.2452	-.0036	-36 27 2.88	11.010	-0.028
γ Hydri	3.2	Ma	3 48 30.514	-0.9631	+0.0096	-74 29 36.94	10.997	+0.117
ζ Persei	2.9	B1	3 48 54.636	+3.7660	+0.0010	+31 38 17.23	+10.836	-0.014
9 H. Camelopardalis	5.2	K0p	3 50 2.934	5.0954	+0.0008	+60 52 1.14	10.750	-0.017
ε Persei	3.0	B0	3 52 16.786	4.0198	+0.0031	+39 46 16.22	10.575	-0.027
ξ Persei	4.0	Oe5	3 53 34.530	3.8873	+0.0012	+35 33 11.66	10.488	-0.017
γ Eridani	3.2	K5	3 54 9.390	2.7985	+0.0047	-13 44 37.92	10.252	-0.111
λ Tauri	var.	B3	3 56 4.802	+3.3218	+0.0002	+12 15 24.18	+10.307	-0.011
δ Reticuli	4.4	Ma	3 57 25.568	0.9412	-.0020	-61 38 2.37	10.215	-0.002
ν Tauri	3.9	A0	3 58 44.331	3.1898	+0.0006	+ 5 45 35.51	10.113	-0.006
λ Tauri	4.5	K0	3 59 47.139	3.5436	+0.0069	+21 51 21.96	9.981	-0.058
ε Persei	4.0	B3p	4 2 37.844	4.3478	+0.0042	+47 29 31.39	9.791	-0.032
ρ Tauri	5.6	F0	4 5 46.378	+3.6495	-.0024	+26 15 55.08	+ 9.540	-0.042
ο Eridani	4.1	F5	4 7 48.789	2.9274	+0.0007	- 7 3 11.25	9.511	+0.086
μ Tauri	4.3	B3	4 11 1.544	3.2558	+0.0016	+ 8 41 7.40	9.152	-0.034
α Horologii	3.8	K0	4 11 15.072	1.9874	+0.0040	-42 29 55.70	8.928	-0.230
α Reticuli	3.4	G5	4 13 21.071	0.7854	+0.0048	-62 40 53.00	9.089	+0.044
γ Tauri	3.9	K0	4 15 4.077	+3.4118	+0.0083	+15 25 41.32	+ 8.834	-0.026
δ Tauri	3.9	K0	4 18 8.755	3.4571	+0.0075	+17 20 55.71	8.588	-0.030
ν Eridani	4.1	K5	4 20 55.139	+2.2520	+0.0052	-34 12 32.57	8.441	+0.042
δ Menæ	5.6	K0	4 23 32.981	-4.1420	+0.0042	-80 24 33.81	8.261	-0.072
ε Tauri	3.6	K0	4 23 46.086	+3.5009	+0.0082	+18 59 50.43	8.187	+0.034
μ Persei	6.1	F0	4 27 34.256	+4.2156	+0.0012	+42 53 15.99	+ 7.871	+0.004
α Tauri (<i>Aldebaran</i>)	1.1	K5	4 31 9.358	3.4402	+0.0047	+16 20 36.31	7.388	-0.189
ν Eridani	4.1	B2	4 32 10.231	2.9959	-.0005	- 3 31 16.42	7.495	0.000
α Doradus	3.5	A0p	4 32 12.109	1.2940	+0.0067	-55 12 58.87	7.482	-0.011
53 Eridani	4.0	K0	4 34 22.647	2.7456	-.0061	-14 27 55.42	7.162	-0.154
τ Tauri	4.3	B5	4 37 15.692	+3.5988	+0.0007	+22 47 55.34	+ 7.061	-0.020
Groombridge 848	6.0	F0	4 37 38.363	8.0232	+0.0095	+75 47 32.16	6.906	-0.144
α Ceti	4.5	F2	4 37 53.125	1.9300	-.0149	-42 1 19.29	6.923	-0.106
4 Camelopardalis	5.4	A2	4 41 5.010	4.9874	+0.0062	+56 36 40.34	6.618	-0.148
μ Eridani	4.2	B5	4 41 21.091	2.9989	+0.0011	- 3 24 21.10	6.736	-0.009
3 ^d Orionis	3.3	F8	4 45 19.982	+3.2552	+0.0012	+ 6 49 2.75	+ 6.489	+0.023
9 Camelopardalis	4.4	B0	4 45 47.437	5.9495	+0.0038	+66 12 12.27	6.383	+0.005
ι Tauri	5.1	F0	4 46 31.010	3.5078	+0.0059	+18 41 58.61	6.283	-0.035
3 ^d Orionis	3.9	B3	4 49 55.628	3.1241	+0.0002	+ 2 18 20.81	6.089	+0.005
ι Aurigæ	2.9	K2	4 51 35.156	3.9041	+0.0009	+33 2 8.90	5.874	-0.021
ε Aurigæ	var.	F5p	4 56 0.620	+4.3016	+0.0012	+43 42 6.11	+ 5.511	-0.013
β Camelopardalis	4.2	G0	4 56 1.676	+5.2265	-.0004	+60 19 21.09	+ 5.512	-0.011

38 Horologii, remarkable purplish red star.

ε Eridani, comp. 9^m, a. 7^m.

γ Tauri, quad., compa. 6^m.3, 7^m.6,

8^m.2, 11^m7^m, 181^m, 190^m.

9 H. Camelop., comp. 8^m, 1^m.9 n. f.

ε Persei, comp. 6^m, 8^m.6 n. f.

λ Tauri, var. 34.95, 3^m.2-4^m.2

λ Tauri, star 6^m.5 f. 38^m, 270^m a.

μ Persei, star 6^m, 115^m a. pr.

ε Aurigæ, var. irreg., 3^m.0-4^m.5

220 MEAN PLACES OF TEN-DAY STARS, 1917.

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
ζ Aurigæ	3.9	K0p	4 56 40.402	+4.1899	+0.013	+40 57 21.44	+5.447	-0.022
ι Tauri	4.7	A5	4 58 8.007	3.5849	+0.056	+21 28 20.43	5.896	-0.049
11 Orionis	4.6	B9	4 59 49.503	3.4268	+0.013	+15 17 22.30	5.187	-0.036
η Aurigæ	3.3	B3	5 0 41.525	4.2044	+0.039	+41 7 24.32	5.058	-0.072
ε Leporis	3.3	K5	5 1 56.812	2.6385	+0.012	-22 28 54.23	4.960	-0.064
β Eridani	2.9	A2	5 3 46.147	+2.9493	-0.056	- 5 11 34.02	+4.795	-0.074
μ Aurigæ	4.8	A3	5 7 44.741	4.1019	-0.020	+38 23 14.50	4.451	-0.080
19 H. Camelopardalis	5.2	F8	5 8 51.183	9.8373	-0.075	+79 8 19.22	4.592	+0.155
μ Leporis	3.3	A0p	5 9 12.161	2.6940	+0.027	-16 18 10.46	4.379	-0.028
β Orionis (Rigel)	0.3	B8p	5 10 32.891	2.8823	.0000	- 8 17 47.84	4.292	0.000
α Aurigæ (Capella)	0.2	G0	5 10 33.306	+4.4290	+0.068	+45 54 53.67	+3.862	-0.429
λ Aurigæ	4.8	G0	5 13 18.021	4.2179	+0.061	+40 1 35.62	3.397	-0.659
τ Orionis	3.7	B5	5 13 34.551	2.9126	-0.009	- 6 55 59.47	4.028	-0.006
ο Columbae	4.9	K0	5 14 29.293	2.1588	+0.027	-34 58 33.35	3.808	-0.352
γ Orionis (Bellatrix)	1.7	B2	5 20 40.711	3.2170	-0.004	+ 6 16 31.57	3.405	-0.017
β Tauri	1.8	B8	5 21 2.635	+3.7914	+0.025	+28 32 18.52	+3.214	-0.177
17 Camelopardalis	5.8	K5	5 22 19.643	5.6603	+0.008	+62 59 58.21	3.278	-0.007
β Leporis	3.0	G0	5 24 41.340	2.5703	.0000	-20 49 29.19	2.987	-0.089
χ Aurigæ	4.9	B1	5 27 19.471	3.9041	+0.006	+32 7 54.32	2.835	-0.013
δ Orionis	2.5	B0	5 27 45.937	3.0643	.0000	- 0 21 34.69	2.808	-0.002
Groombridge 966	6.4	K5	5 28 37.064	+8.0101	-0.002	+74 59 28.43	+2.753	+0.017
α Leporis	2.7	F0	5 29 4.156	2.6457	+0.003	-17 52 51.25	2.697	0.000
φ Orionis	4.5	B0	5 30 15.778	3.2927	-0.002	+ 9 26 3.34	2.578	-0.015
ι Orionis	2.9	Oe5	5 31 22.359	2.9343	+0.001	- 5 57 48.67	2.495	-0.002
ε Orionis	1.8	B0	5 32 0.075	3.0436	.0000	- 1 15 14.21	2.444	+0.001
ζ Tauri	3.0	B3	5 32 41.020	+3.5850	+0.006	+21 5 34.40	+2.352	-0.032
ι Orionis	2.0	B0	5 36 34.227	3.0270	+0.005	- 1 59 8.47	2.032	-0.014
α Columbae	2.8	B5p	5 36 38.609	2.1725	+0.006	-34 7 4.00	2.001	-0.038
ο Aurigæ	5.5	A0	5 39 28.107	4.6454	-0.013	+49 47 28.40	1.775	-0.018
ζ Leporis	3.7	A2	5 43 11.644	2.7179	-0.013	-14 51 7.32	1.468	-0.001
κ Orionis	2.2	B0	5 43 49.186	+2.8449	+0.001	- 9 41 53.66	+1.411	-0.003
δ Doradus	4.5	A5	5 44 37.312	0.1023	-0.081	-65 46 0.00	1.348	-0.001
ν Aurigæ	4.2	K0	5 45 44.198	4.1574	-0.001	+39 7 31.68	1.260	+0.012
δ Leporis	3.9	K0	5 47 45.084	2.5796	+0.162	-20 53 7.11	0.422	-0.649
α Orionis (Betelgeux)	var.	Ma	5 50 40.683	3.2479	+0.020	+ 7 23 33.32	0.624	+0.009
η Leporis	3.8	F5	5 52 37.461	+2.7323	-0.028	-14 10 55.27	+0.786	+0.141
δ Aurigæ	3.9	K0	5 52 41.636	4.9419	+0.118	+54 16 47.67	0.520	-0.118
β Aurigæ	2.1	A0p	5 53 26.464	4.4019	-0.038	+44 56 25.22	0.568	-0.006
θ Aurigæ	2.7	A0p	5 54 3.685	4.0917	+0.047	+37 12 28.56	+0.429	-0.091
1 Geminorum	4.3	G5	5 59 4.505	3.6475	+0.002	+23 16 7.83	-0.028	-0.109
1 G. Puppis	6.2	F8	6 2 5.082	+1.7258	-0.068	-45 2 9.80	+0.043	+0.225
ν Orionis	4.4	B2	6 2 50.011	3.4284	+0.012	+14 46 45.79	-0.273	-0.026
22 H. Camelopardalis	4.7	A0	6 9 42.225	6.6182	+0.026	+69 21 3.47	0.962	-0.114
η Geminorum	var.	Ma	6 9 52.098	3.6227	-0.039	+22 31 54.92	0.879	-0.016
2 Lyncis	4.4	A0	6 12 18.204	5.2984	+0.012	+59 2 33.52	1.046	+0.030
ζ Canis Majoris	3.1	B3	6 17 7.529	+2.3019	-0.006	-30 1 34.03	-1.520	-0.023
μ Geminorum	3.2	Ma	6 17 56.386	3.6307	+0.046	+22 33 26.30	1.682	-0.114
ψ Aurigæ	5.1	K2	6 18 30.538	4.6289	+0.020	+49 19 54.02	1.621	-0.004
β Canis Majoris	2.0	B1	6 19 2.655	2.6416	-0.006	-17 54 49.68	1.660	+0.004
8 Monocerotis	4.5	A5	6 19 22.225	3.1802	-0.004	+ 4 38 9.54	1.683	+0.009
α Argus (Canopus)	-0.9	F0	6 22 6.565	+1.3319	+0.022	-52 39 0.04	-1.922	+0.009
10 Monocerotis	5.0	B3	6 23 51.718	2.9641	+0.010	- 4 42 35.53	2.077	+0.006
ν Geminorum	4.1	B5	6 24 2.105	3.5629	-0.005	+20 15 56.75	2.114	-0.016
8 Lyncis	6.0	G0	6 30 6.605	5.4917	-0.027	+61 33 20.84	2.902	-0.276
ξ Canis Majoris	4.5	A0	6 31 34.686	2.5158	+0.022	-22 53 51.86	2.718	+0.035
23 H. Camelopardalis	5.6	F8	6 32 5.571	+10.2957	-0.078	+79 39 25.93	-3.431	-0.633
51 Aurigæ	5.7	K0	6 32 54.535	+4.1596	-0.020	+39 27 54.79	-2.061	-0.113

β Orionis, comp. 8^m.0, 9^s.5 a. pr.
 δ Orionis, star 6^m.9, 52^s.6 n.
 ι Orionis, comp. 7^m.3, 11^s.5 a. f.

ζ Orionis, comp. 4^m.2, 2^s.4 a. f.
 α Orionis red star, var. irreg. 1^m.0-1^m.4
 θ Aurigæ, comp. 7^m.5, 2^s.5 n. pr.

1 Puppis, star, 5^m.8, 150^s.1 f.
 γ Gem., var. 23^d.4, 3^m.2-4^m.2, comp. 8^m.8, 1^s.2 n. pr.
 8 Monoc., star, 6^m.5, 13^s.7 n. f.

MEAN PLACES OF TEN-DAY STARS, 1917. 221

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spectr- um.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
γ Geminorum	1.9	A0	6 32 55.063	+3.4670	+0.0083	+16 28 16.07	-2.917	-0.048
γ Argus	3.2	B8	6 35 13.382	1.8367	+0.006	-43 7 21.57	3.083	-0.019
S Monocerotis	4.7	Oe5	6 36 24.445	3.3047	+0.000	+9 58 24.51	3.179	-0.008
ε Geminorum	3.2	G5	6 38 49.590	3.6928	-0.001	+25 12 51.95	3.398	-0.018
ξ Geminorum	3.4	F5	6 40 37.896	3.3684	-0.076	+12 59 10.03	3.728	-0.198
ψ ⁴ Aurigæ	5.3	G0	6 40 45.621	+4.3296	+0.018	+43 39 40.70	-3.386	+0.160
α Canis Majoris (Sirius)†	-1.6	A0	6 41 29.433	2.6434	-0.073	-16 36 5.39	4.818	-1.206
18 Monocerotis	4.7	K0	6 43 31.963	3.1281	-0.020	+2 30 14.20	3.801	-0.016
43 Camelopardalis	5.1	B5	6 44 45.850	6.4874	+0.021	+68 59 12.22	3.878	+0.012
θ Geminorum	3.6	A2	6 47 19.245	3.9680	+0.010	+34 3 45.02	4.160	-0.060
α Pictoris	3.3	A5	6 47 20.476	+0.6175	-0.0104	-61 51 7.91	-3.373	+0.238
τ Argus	2.8	K0	6 47 52.585	1.4883	+0.025	-50 30 56.32	4.264	-0.107
15 Lyncis	4.5	K0	6 50 5.803	5.2064	+0.021	+58 31 59.14	4.477	-0.130
θ Canis Majoris	4.2	K2	6 50 20.048	2.7879	-0.091	-11 56 1.24	4.374	-0.007
ε Canis Majoris	1.6	B1	6 55 21.817	2.3575	-0.001	-28 51 30.10	4.793	+0.003
ζ Geminorum	var.	G0	6 59 11.248	+3.5805	-0.002	+20 41 35.05	-5.127	-0.007
σ Canis Majoris	3.1	B5p	6 59 33.520	2.5049	-0.006	-23 42 40.29	5.146	+0.005
γ Canis Majoris	4.1	B5	7 0 0.220	2.7148	+0.003	-15 30 35.28	5.198	-0.010
δ Canis Majoris	2.0	F8	7 5 0.931	2.4882	-0.015	-26 15 38.37	5.607	+0.003
63 Aurigæ	5.1	K2	7 5 56.990	4.1326	+0.062	+39 27 25.69	5.692	-0.003
51 Geminorum	5.3	Mb	7 8 36.417	+3.4479	+0.019	+16 18 2.98	-5.953	-0.042
γ ² Volantis	3.9	K0	7 9 27.280	-0.5019	+0.004	-70 21 51.69	5.905	+0.078
λ Geminorum	3.6	A2	7 13 19.471	+3.4801	-0.029	+16 41 27.81	6.349	-0.045
π Argus	2.7	K5	7 14 12.680	2.1189	-0.006	-36 56 52.95	6.388	-0.010
δ Geminorum	3.5	F0	7 15 10.085	+3.5863	-0.010	+22 8 10.35	6.472	-0.015
δ Volantis	4.0	F5	7 16 52.958	-0.0199	+0.004	-67 48 19.34	-6.605	-0.006
ε Geminorum	3.9	K0	7 20 34.438	+3.7302	-0.086	+27 57 50.80	6.991	-0.067
η Canis Majoris	2.4	B5p	7 20 48.770	2.3738	+0.003	-29 8 25.61	6.916	+0.007
Groombridge 1308	5.8	K0	7 22 15.511	6.2732	+0.018	+68 38 12.89	7.086	-0.045
β Canis Minoris	3.1	B8	7 22 39.049	8.2554	-0.082	+8 27 26.92	7.120	-0.047
ρ Geminorum	4.2	F0	7 23 46.515	+3.8628	+0.018	+31 57 2.93	-6.982	+0.183
σ Argus	3.3	K5	7 26 35.800	1.9018	-0.072	-43 7 58.09	7.215	+0.180
α ² Geminorum (Castor)	2.0	A0	7 29 18.402	8.8329	-0.014	+32 4 19.07	7.697	-0.062
α ¹ Geminorum	2.8	A0	Δα - 0.255	....	....	Δδ - 4.13	....	....
25 Monocerotis	5.2	F5	7 33 9.064	2.9819	-0.066	-3 55 28.96	7.903	+0.022
α Can. Min. (Procyon)†	0.5	F5	7 34 57.476	+3.1420	-0.047	+5 26 18.37	-9.107	-1.037
24 Lyncis	5.0	A2	7 35 59.578	5.0927	-0.042	+58 54 21.49	8.209	-0.056
κ Geminorum	3.7	G5	7 39 26.375	3.6363	-0.014	+24 35 52.70	8.487	-0.060
β Geminorum (Pollux)	1.2	K0	7 40 14.369	3.6755	-0.070	+28 13 39.63	8.545	-0.065
4 Puppis	5.1	F2	7 42 7.563	2.7636	-0.003	-14 21 40.59	8.642	-0.002
ξ Argus	3.5	G0	7 45 48.212	+2.5232	-0.004	-24 39 2.57	-8.929	0.000
φ Geminorum	5.0	A2	7 48 25.235	3.6763	-0.020	+26 58 54.15	9.160	-0.027
26 Lyncis	5.7	K0	7 48 40.533	4.3807	-0.022	+47 46 51.38	9.158	-0.006
Groombridge 1374	5.6	K0	7 50 17.290	7.2404	-0.023	+74 8 29.49	9.315	-0.087
χ Argus	3.6	B3	7 54 40.144	1.5268	-0.043	-52 45 33.92	9.611	+0.006
ω Cancri	5.9	K0	7 55 54.675	+3.6336	+0.003	+25 37 15.44	-9.715	-0.004
χ Geminorum	5.0	K0	7 58 25.439	3.6900	-0.012	+28 1 40.62	9.956	-0.053
27 Lyncis	4.9	A2	8 2 13.397	4.5891	-0.082	+51 44 49.80	10.193	-0.003
ρ Argus	2.9	F5	8 4 0.537	2.5646	-0.065	-24 3 51.19	10.273	+0.052
3 H. Ursæ Majoris	5.5	G5	8 4 34.242	6.0095	+0.002	+68 43 11.87	10.362	+0.005
γ Argus	2.2	Oap	8 6 58.547	+1.8498	-0.003	-47 5 29.77	-10.557	-0.011
ζ Cancri (mean)	4.7	G0	8 7 27.241	3.4443	+0.061	+17 53 56.75	10.710	-0.129
Bradley 1147	5.7	G5	8 9 9.080	7.6155	+0.077	+76 0 43.16	10.715	-0.008
20 Puppis	5.0	G5	8 9 31.072	2.7680	-0.009	-15 32 14.58	10.733	+0.001
β Cancri	3.8	K2	8 12 0.915	3.2855	-0.085	+9 26 31.93	10.971	-0.052
31 Lyncis	4.4	K5	8 17 9.656	+4.1202	+0.015	+43 27 19.70	-11.393	-0.100
α ¹ Cancri	5.9	F0	8 18 36.816	+3.4888	-0.008	+18 35 58.31	-11.429	-0.031

8 Monoc., comp. 8^m.8, 2^m.9 a. pr.

15 Lyncis, dup., 4^m.9, 6^m.2, 0^m.7

ε Can. Maj., comp. 9^m, 7^m.8 a. l.

ζ Gem., var., 104.15, 3^m.7-4^m.3

γ² Volantis, comp. 5^m.8, 12^m.9 n. pr.

δ Gem., comp. 8^m, 7^m.0 a. pr.

σ Argus, star 8^m, 22^m.4 n. l.

α Gem., comp. 8^m.5, 6^m.6 a. pr.

γ Argus, star 5^m.42^m.5 a. pr.

ζ Cancri, triple; binary 5^m.6, 6^m.3, 1^m with comp. 6^m.0, 6^m.4 a. l.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page xli remain to be applied to reduce to the positions of the stars.

222 MEAN PLACES OF TEN-DAY STARS, 1917.

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spectr- um.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h	m	s	s	s	"	"	"
ε Argus	1.7	K0p	8	20	48.714	+1.2336	-.0042	-59 14 31.56	-11.548	+0.008
30 Monocerotis	4.0	A0	8	21	30.868	+2.9695	-.0039	- 3 38 5.42	11.625	-0.020
θ Chamæleontis	4.3	K0	8	23	9.121	-1.7505	-.0461	-77 13 2.21	11.705	+0.017
ο Urse Majoris	3.5	G0	8	23	22.930	+5.0107	-.0160	+60 59 48.78	11.851	-0.112
Groombridge 1450	6.0	K0	8	27	31.536	3.9087	-.0082	+38 18 7.19	12.209	-0.179
η Cancrī	5.5	B5p	8	27	54.709	+3.4741	-.0025	+20 43 26.13	-12.112	-0.055
Groombridge 1446	6.3	K0	8	30	30.691	6.7404	-.0043	+73 55 16.50	12.356	-0.117
δ Hydræ	4.2	A0	8	33	15.820	3.1780	-.0048	+ 5 59 38.31	12.442	-0.014
σ Hydræ	4.5	K0	8	34	25.244	3.1882	-.0008	+ 3 38 1.20	12.530	-0.013
γ Cancrī	4.7	A0	8	38	29.155	3.4766	-.0071	+21 46 4.17	12.826	-0.043
δ Cancrī	4.2	K0	8	39	58.256	+3.4136	-.0009	+18 27 36.47	-13.123	-0.240
α Pyxidīs	3.7	B2	8	40	15.384	2.4111	-.0003	-32 53 11.68	12.891	+0.011
ι Cancrī	4.2	G5	8	41	40.736	3.6375	-.0006	+29 3 51.60	13.048	-0.051
ε Hydræ	3.5	F8	8	42	22.940	3.1796	-.0127	+ 6 43 26.95	13.092	-0.043
δ Argus	2.0	A0	8	42	24.502	1.6517	-.0035	-54 24 14.47	13.145	-0.100
σ Cancrī (mean)	5.5	K0	8	49	11.090	+3.6675	+0.0034	+30 53 40.50	-13.511	-0.021
ζ Hydræ	3.3	K0	8	51	0.503	3.1743	-.0060	+ 6 15 43.81	13.600	+0.007
ι Urse Majoris	3.1	A5	8	53	31.958	4.1218	-.0435	+48 22 6.23	14.017	-0.248
α Cancrī	4.3	A3	8	53	56.993	3.2844	+0.0024	+12 10 46.93	13.837	-0.042
β Carinæ	5.1	B3	8	54	56.499	1.4680	-.0034	-58 54 31.66	13.877	-0.019
κ Urse Majoris	3.7	A0	8	57	57.998	+4.1098	-.0027	+47 29 8.31	-14.115	-0.067
σ Urse Majoris	4.9	F8	9	3	6.642	5.3194	-.0003	+67 28 21.53	14.432	-0.066
κ Cancrī	5.1	B8	9	3	15.224	3.2825	-.0012	+11 0 10.48	14.387	-0.013
λ Argus	2.2	K5	9	4	56.550	2.2063	-.0015	-43 5 49.80	14.483	-0.007
θ Hydræ	3.8	A0	9	10	2.860	3.1235	+0.0088	+ 2 39 54.55	15.094	-0.312
β Argus	1.8	A0	9	12	17.664	+0.6692	-.0310	-69 22 30.83	-14.820	+0.094
83 Cancrī	6.6	F5	9	14	21.132	3.3533	-.0076	+18 3 28.33	15.170	-0.126
ι Argus	2.2	F0	9	14	51.990	1.6040	-.0055	-58 55 35.56	15.067	+0.096
40 Lyncis	3.3	K5	9	16	0.205	3.6630	-.0178	+34 44 39.40	15.116	+0.012
θ Pyxidīs	4.9	Ma	9	17	48.883	2.6514	-.0048	-25 36 43.41	15.264	-0.032
α Hydræ	2.2	K2	9	23	30.551	+2.9486	-.0010	- 8 17 53.44	-15.518	+0.083
h Urse Majoris	3.8	F0	9	25	0.187	4.7632	+0.0183	+63 25 32.34	15.609	+0.024
d Urse Majoris	4.6	G0	9	27	10.177	5.3569	-.0112	+70 11 46.05	15.680	+0.071
θ Urse Majoris	3.3	F8	9	27	18.915	4.0293	-.1026	+52 3 23.10	16.302	-0.543
φ Argus	3.6	F5	9	27	25.682	2.3595	-.0181	-40 6 11.48	15.737	+0.036
ξ Leonis	5.1	G5	9	27	28.447	+3.2367	-.0063	+11 40 4.89	-15.851	-0.064
10 Leonis Minoris	4.6	G5	9	29	8.652	3.6845	+0.011	+36 46 0.55	15.878	-0.021
ο Leonis	3.8	F5p	9	36	43.370	3.2048	-.0096	+10 16 14.25	16.287	-0.088
θ Antilæ	5.0	F5	9	40	30.080	2.6732	-.0036	-27 23 20.26	16.416	+0.029
ε Leonis	3.1	G0p	9	41	8.593	3.4106	-.0084	+24 9 25.02	16.499	-0.022
υ Argus	3.2	F0	9	45	1.689	+1.5007	-.0025	-64 41 12.71	-16.684	-0.017
υ Urse Majoris	3.9	F0	9	45	6.034	4.2905	-.0382	+59 25 47.52	16.930	-0.157
6 Sextantis	6.0	A3	9	47	3.136	3.0244	+0.011	- 3 51 13.59	16.796	-0.028
μ Leonis	4.1	K0	9	48	2.755	3.4167	-.0171	+26 23 54.51	16.868	-0.054
Groombridge 1586	6.0	K0	9	50	59.596	5.4262	-.0197	+73 16 29.75	17.012	-0.060
19 Leonis Minoris	5.2	F5	9	52	36.398	+3.6843	-.0111	+41 27 5.64	-17.050	-0.022
φ Argus	3.7	B5	9	53	56.760	2.1018	-.0033	-54 10 21.11	17.109	-0.020
π Leonis	4.9	Ma	9	55	49.720	3.1721	-.0029	+ 8 26 34.70	17.201	-0.027
η Leonis	3.6	A0p	10	2	48.496	3.2725	-.0022	+17 10 4.54	17.486	-0.004
α Leonis (Regulus)	1.3	B8	10	3	57.221	3.1980	-.0169	+12 22 23.99	17.532	-0.002
λ Hydræ	3.8	K0	10	6	32.504	+2.9247	-.0137	-11 56 35.89	-17.736	-0.088
γ Velorum	4.1	A2	10	11	14.886	2.5131	-.0153	-41 42 37.28	17.798	+0.032
32 Urse Majoris	5.7	A3	10	12	1.438	4.3911	-.0140	+65 31 22.84	17.874	-0.012
ζ Leonis	3.6	F0	10	12	4.638	3.3419	+0.0014	+23 49 53.14	17.872	-0.009
λ Urse Majoris	3.5	A0	10	12	5.897	3.6808	-.0142	+43 19 45.96	17.903	-0.088
γ Leonis pr.	2.6	K0	10	15	23.938	+3.3113	+0.0212	+20 15 42.71	-18.145	-0.152
μ Urse Majoris	3.2	K5	10	17	23.446	+3.5852	-.0063	+41 55 2.74	-18.043	+0.037

ι Cancrī, star 6^m.8, 30^s.6 n. pr.
 υ Hydræ, triple; binary 3^m.5, 6^m.8,
 0^s.2, with comp. 7^m.8, 3^s.3
 δ Argus, comp. 5^m, 2^s.8

σ Cancrī, dup. 5^m.9, 6^m.4, 1^s.4
 β Carinæ, comp. 7^m.2, 5^s.1
 σ Urs. Maj., binary 4^m.9, 8^m, 1^s.3

φ Argus, dup. 3^m.8, 6^m.0, 0^s.8
 υ Argus, comp. 6^m.0, 4^s.9 s. f.
 γ Leonis, comp. 3^m.8, 3^s.7 s. f.

MEAN PLACES OF TEN-DAY STARS, 1917. 223

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
30 H. Ursæ Majoris . . .	4.9	A0	10 18 10.162	+4.3597	-.0024	+65 59 12.23	-18.117	-0.018
μ Hydreæ . . .	4.1	K5	10 22 4.536	2.9006	-.0089	-16 24 43.67	18.322	-0.079
31 Leonis Minoris . . .	4.4	K0	10 23 5.378	3.4785	-.0094	+37 7 58.41	18.392	-0.112
α Antilæ . . .	4.4	K5	10 23 21.115	2.7426	-.0060	-30 38 42.55	18.312	-0.023
36 Ursæ Majoris . . .	4.8	F5	10 25 19.572	8.8595	-.0208	+56 24 23.75	18.398	-0.039
9 H. Draconis . . .	5.0	G5	10 28 4.749	+5.1792	-.0084	+76 8 28.04	-18.464	-0.009
ρ Leonis . . .	3.8	B0p	10 28 26.559	3.1614	-.0004	+ 9 44 2.93	18.470	-0.003
33 Sextantis . . .	6.4	K0	10 37 10.837	3.0519	-.0100	- 1 18 16.79	18.861	-0.110
41 Leonis Minoris . . .	5.0	A2	10 38 54.375	3.2688	-.0084	+23 37 23.92	18.794	+0.009
θ Argus . . .	3.0	B0	10 39 59.488	2.1328	-.0043	-63 57 35.70	18.864	-0.027
42 Leonis Minoris . . .	5.4	B9	10 41 15.213	+3.3421	-.0024	+31 7 11.33	-18.915	-0.041
η Argus . . .	†	var.	10 41 50.234	2.3312	-.0002	-59 14 52.58	18.900	-0.009
μ Argus . . .	†	G5	10 43 11.758	2.5740	+0.0066	-48 58 53.94	19.011	-0.081
l Leonis . . .	5.3	A0	10 44 53.786	3.1863	+0.0001	+10 59 4.66	19.012	-0.033
δ ² Chamæleontis . . .	†	B3	10 45 1.016	0.5921	-.0192	-80 6 8.64	18.986	-0.004
ν Hydreæ . . .	3.3	Ma	10 45 31.690	+2.9583	+0.0061	-15 45 31.67	-18.786	+0.211
46 Leonis Minoris . . .	3.9	K0	10 48 40.473	3.3630	+0.0074	+34 39 45.71	19.365	-0.283
54 Leonis . . .	†	A0	10 51 7.318	3.2527	-.0060	+25 11 33.92	19.165	-0.018
ι Antilæ . . .	4.7	K0	10 52 51.107	2.7963	+0.0112	-36 41 28.88	19.329	-0.138
Groombridge 1706 . . .	6.3	G5	10 53 21.248	4.8827	-.0264	+78 12 54.54	19.239	-0.035
α Crateris . . .	4.2	K0	10 55 43.737	+2.9208	-.0327	-17 51 24.26	-19.155	+0.106
d Leonis . . .	5.0	K0	10 56 16.480	3.0991	+0.0004	+ 4 3 48.08	19.298	-0.022
β Ursæ Majoris . . .	2.4	A0	10 56 50.595	3.6394	+0.0105	+56 49 39.35	19.263	+0.026
α Ursæ Majoris . . .	2.0	K0	10 58 37.132	3.7270	-.0164	+62 11 57.70	19.402	-0.071
χ Leonis . . .	4.7	F0	11 0 44.205	3.0960	-.0234	+ 7 47 6.38	19.420	-0.041
p ¹ Leonis . . .	5.7	K0	11 2 40.246	+3.0612	-.0253	+ 2 24 23.26	-19.502	-0.080
ψ Ursæ Majoris . . .	3.2	K0	11 5 0.238	3.3944	-.0053	+44 56 56.81	19.504	-0.033
φ Crateris . . .	4.5	A2	11 7 34.425	2.9478	.0000	-22 22 21.40	19.630	-0.106
δ Leonis . . .	2.6	A2	11 9 41.824	3.1950	+0.0108	+20 58 43.01	19.705	-0.141
θ Leonis . . .	3.4	A0	11 9 53.160	3.1503	-.0049	+15 53 0.32	19.653	-0.065
ν Ursæ Majoris . . .	3.7	K0	11 13 59.997	+3.2475	-.0018	+33 32 50.74	-19.617	+0.026
δ Crateris . . .	3.8	K0	11 15 11.376	2.9975	-.0088	-14 19 45.19	19.468	+0.195
σ Leonis . . .	4.1	A0	11 16 51.400	3.0949	-.0062	+ 6 29 4.09	19.704	-0.013
π Centauri . . .	4.3	B5	11 17 12.999	2.7367	-.0041	-54 2 9.66	19.710	-0.013
ι Leonis . . .	†	F5	11 19 35.891	3.1285	+0.0103	+10 59 11.67	19.818	-0.083
τ Leonis . . .	5.2	K0	11 23 40.156	+3.0867	+0.0008	+ 3 18 48.67	-19.811	-0.016
λ Draconis . . .	4.1	Ma	11 26 29.629	3.5942	-.0072	+69 47 21.55	19.852	-0.021
ε Hydreæ . . .	3.7	G5	11 28 55.004	2.9466	-.0158	-31 23 54.02	19.916	-0.055
λ Centauri . . .	3.3	B9	11 31 56.642	2.7511	-.0073	-62 33 37.87	19.922	-0.027
υ Leonis . . .	4.5	K0	11 32 41.941	3.0716	.0000	- 0 21 55.34	19.864	+0.039
π Chamæleontis . . .	5.7	F0	11 33 49.733	+2.4542	-.0323	-75 26 13.46	-19.937	-0.023
3 Draconis . . .	5.5	K0	11 37 51.393	3.3714	-.0080	+67 12 15.59	19.917	+0.035
ζ Crateris . . .	4.9	G5	11 40 33.229	3.0379	+0.0018	-17 53 21.29	20.014	-0.041
χ Ursæ Majoris . . .	3.8	K0	11 41 40.449	3.1794	-.0128	+48 14 22.74	19.961	+0.020
β Leonis (<i>Denebola</i>) . . .	2.2	A2	11 44 49.653	3.0623	-.0341	+15 2 9.92	20.120	-0.118
β Virginis . . .	3.8	F8	11 46 22.311	+3.1282	+0.0494	+ 2 13 57.16	-20.294	-0.275
Groombridge 1830 . . .	6.5	G5	11 48 12.010	3.4671	+0.3401	+38 18 52.10	25.802	-5.784
γ Ursæ Majoris . . .	2.5	A0	11 49 28.353	3.1691	+0.0115	+54 9 22.47	20.020	+0.004
π Virginis . . .	4.6	A3	11 56 37.180	3.0742	-.0009	+ 7 4 37.72	20.075	-0.032
ο Virginis . . .	4.2	G5	12 0 58.908	3.0570	-.0148	+ 9 11 37.95	20.013	+0.032
δ Centauri . . .	2.9	B3p	12 4 2.987	+3.0960	-.0050	-50 15 37.19	-20.072	-0.030
ε Corvi . . .	3.2	K0	12 5 51.206	3.0815	-.0061	-22 9 29.59	20.036	+0.003
4 H. Draconis . . .	5.1	A5	12 8 19.650	2.8453	+0.0026	+78 4 38.71	20.013	+0.019
δ Crucis . . .	3.1	B3	12 10 44.064	3.1760	+0.0021	-58 17 15.32	20.062	-0.038
δ Ursæ Majoris . . .	3.4	A2	12 11 19.618	2.9840	+0.0150	+57 29 37.50	20.016	+0.005
γ Corvi . . .	2.8	B8	12 11 32.104	+3.0819	-.0114	-17 4 51.83	-20.003	+0.017
2 Canum Venaticorum † . . .	5.8	K5	12 11 58.355	+3.0156	+0.0038	+41 7 19.27	-20.064	-0.046

η Argus, var., irreg., 1st 6-6 m. 6
μ Argus, comp. 7 m., 2" 2 n. f.

δ² Cham., star 5 m. 5 pr. 32" 256" n.
54 Leonis, comp. 6 m. 3, 6" 4 s. f.

ι Leonis, comp. 6 m. 8, 2" 6 n. f.
2 Can. Ven., star 8 m., 11" 6 s. pr.

224 MEAN PLACES OF TEN-DAY STARS, 1917.

FOR JANUARY 0^h.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
β Chamæleontis	4.4	B5	12 13 26.825	+3.4515	-0.188	-78 51 4.93	-19.994	+0.017
η Virginis	4.0	A0	12 15 39.568	3.0694	-0.036	- 0 12 20.31	20.026	-0.027
α^1 Crucis	1.6	B1	12 21 58.181	3.3134	-0.064	-62 38 21.43	19.993	-0.039
α^2 Crucis	2.1		$\Delta\alpha + 0.628$	.....	.....	$\Delta\delta - 1.87$	.....	.....
20 Comæ	5.7	A2	12 25 33.217	3.0181	+0.086	+21 21 20.18	19.957	-0.086
δ Corvi	3.1	A0	12 25 34.065	+3.1014	-0.140	-16 3 12.48	-20.069	-0.149
γ Crucis	1.6	Mb	12 26 33.028	3.3046	-0.028	-56 38 54.24	20.172	-0.261
δ Canum Venaticorum	4.3	G0	12 29 48.338	2.8560	-0.017	+41 48 29.82	19.597	+0.279
κ Draconis	3.9	B5p	12 29 56.924	2.5766	-0.112	+70 14 44.25	19.364	+0.010
β Corvi	2.8	G5	12 30 1.405	3.1458	-0.008	-22 56 16.40	19.935	-0.061
24 Comæ seq.	5.2	K0	12 30 58.031	+3.0106	-0.007	+18 50 1.51	-19.860	+0.013
α Muscæ	2.9	B3	12 32 13.073	3.5436	-0.068	-68 40 42.18	19.876	-0.029
χ Virginis	4.8	K0	12 34 57.636	3.0939	-0.056	- 7 32 20.34	19.843	-0.031
γ Centauri	2.4	A0	12 36 55.952	3.2955	-0.196	-48 30 15.08	19.805	-0.020
γ Virginis (mean)	2.9	F0	12 37 27.290	3.0399	-0.036	- 0 59 39.62	19.774	+0.004
ρ Virginis	5.0	A0	12 37 41.049	+3.0372	+0.058	+10 41 33.89	-19.832	-0.107
76 Ursæ Majoris	5.9	A0	12 37 56.652	2.6307	-0.065	+63 10 6.88	19.790	-0.018
β Crucis	1.5	B1	12 42 51.646	3.4836	-0.064	-59 14 7.14	19.729	-0.033
31 Comæ	5.1	G0	12 47 39.407	2.9238	-0.022	+27 59 31.52	19.638	-0.024
n Centauri	4.3	A5	12 48 50.062	3.3135	+0.060	-39 43 39.77	19.626	-0.035
ε Ursæ Majoris (<i>Alioth</i>)	1.7	A0p	12 50 22.936	+2.6477	+0.138	+56 24 36.46	-19.576	-0.012
δ Virginis	3.7	Ma	12 51 25.308	3.0209	-0.018	+ 3 50 53.79	19.603	-0.060
α Canum Venat. seq.	2.9	A0p	12 52 8.856	2.8103	-0.023	+38 45 58.99	19.480	+0.049
δ Muscæ	3.6	K2	12 56 32.256	4.0755	+0.096	-71 6 5.16	19.470	-0.031
ε Virginis	3.0	K0	12 58 2.714	2.9885	-0.186	+11 24 17.96	19.391	+0.015
θ Virginis	4.4	A0	13 5 39.035	+3.1034	-0.029	- 5 5 46.26	-19.269	-0.040
43 Comæ	4.3	G0	13 8 0.119	2.8024	-0.099	+28 17 55.05	18.291	+0.879
20 Canum Venaticorum	4.7	F0	13 13 49.448	2.6954	-0.094	+41 0 33.61	18.999	+0.015
γ Hydræ	3.3	G5	13 14 24.338	3.2559	+0.046	-22 44 2.20	19.061	-0.053
ι Centauri	2.9	A2	13 15 55.465	3.3623	-0.294	-36 16 29.40	19.052	-0.097
ζ^1 Ursæ Maj. (<i>Mizar</i>)	2.4	A0p	13 20 35.249	+2.4218	+0.153	+55 21 30.68	-18.848	-0.030
ζ^2 Ursæ Majoris	4.0	A0	$\Delta\alpha + 0.916$	.....	.....	$\Delta\delta - 12.40$	.....	.....
α Virginis (<i>Spica</i>)	1.2	B2	13 20 49.090	3.1573	-0.026	-10 43 42.19	18.844	-0.082
Groombridge 2001	6.1	K5	13 24 0.915	1.5244	+0.012	+72 49 19.90	18.732	-0.019
70 Virginis	5.2	G5	13 24 22.227	2.9340	-0.168	+14 13 18.23	19.236	-0.584
ζ Virginis	3.4	A2	13 30 27.735	+3.0546	-0.195	- 0 10 18.77	-18.465	+0.039
17 H. Canum Venaticorum	5.0	F0	13 31 5.572	2.6815	+0.078	+37 36 26.55	18.487	-0.004
ε Centauri	2.6	B1	13 34 37.129	3.7814	-0.039	-53 2 41.91	18.400	-0.039
m Virginis	5.2	Ma	13 37 15.201	3.1454	-0.073	- 8 17 4.56	18.235	+0.032
τ Boötis	4.5	F5	13 43 19.071	2.8508	-0.041	+17 52 11.79	18.016	+0.026
η Ursæ Majoris (<i>Alkaid</i>)	1.9	B3	13 44 16.341	+2.3678	-0.118	+49 43 37.57	-18.029	-0.023
89 Virginis	5.1	K0	13 45 21.487	3.2544	-0.077	-17 43 16.12	18.005	-0.040
ζ Centauri	3.1	B2p	13 50 21.223	3.7266	-0.070	-46 52 49.39	17.830	-0.064
η Boötis	2.8	G0	13 50 43.968	2.8567	-0.044	+18 48 47.97	18.114	-0.363
θ Apodis	var.	Mb	13 57 11.699	5.7459	-0.293	-76 23 48.82	17.510	-0.029
11 Boötis	6.1	A3	13 57 24.729	+2.7215	-0.060	+27 47 13.03	-17.467	+0.005
τ Virginis	4.3	A2	13 57 25.268	3.0514	+0.010	+ 1 56 44.56	17.500	-0.029
β Centauri	0.9	B1	13 57 57.232	4.2075	-0.033	-59 58 23.52	17.432	-0.033
π Hydræ	3.5	K0	14 1 38.444	3.4099	+0.031	-26 16 59.18	17.434	-0.146
θ Centauri	2.3	K0	14 1 47.518	3.5203	-0.037	-35 57 43.84	17.806	-0.526
α Draconis	3.6	A0	14 2 8.553	+1.6245	-0.071	+64 46 20.01	-17.254	+0.011
d Boötis	4.8	F5	14 6 36.864	2.7370	-0.014	+25 29 3.30	17.141	-0.078
κ Virginis	4.3	K0	14 8 27.955	+3.1971	+0.006	- 9 53 16.58	16.846	+0.132
4 Ursæ Minoris	5.0	K0	14 9 9.051	-0.2786	-0.108	+77 56 14.88	16.920	+0.026
ι Virginis	4.2	F5	14 11 39.592	+3.1426	-0.013	- 5 36 17.81	17.265	-0.427
α Boötis (<i>Arcturus</i>)	0.2	K0	14 11 52.501	+2.7356	-0.079	+19 36 50.39	-18.821	-2.003
λ Boötis	4.3	A0	14 13 13.805	+2.2530	-0.172	+46 28 8.27	-16.602	+0.151

δ Corvi, star 8^m, 24^m.4 s. pr.
 γ Crucis, star 6^m.8, 85^m n. l.
 24 Comæ, star 6^m.7, 20^m.6 pr.
 γ Cent., dup., 3=1, 3=1, 1^m.7

γ Virginis, binary, 3=7, 3=7, 6^m.2,
 P=325^s
 α Can. Ven., star 5^m, 19^m.8 s. pr.
 θ Virginis, comp. 9=, 7^m.1 n. pr.

ζ^1 Ursæ Maj., star Alcor 4=0, l. 79=3
 222^m n.
 θ Apodis, var. irreg., 5=5-6=6

MEAN PLACES OF TEN-DAY STARS, 1917. 225

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			<i>h m s</i>	<i>s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>
λ Virginis	4.6	A2	14 14 36.912	+3.2411	-.0024	-12 59 22.71	-16.665	+0.021
2 Libræ	6.3	K0	14 18 57.478	3.2240	-.0014	-11 20 7.90	16.539	-0.067
θ Boötis	4.1	F8	14 22 22.329	2.0433	-.0254	+52 14 2.20	16.706	-0.406
ƒ Boötis	5.4	A5	14 22 35.703	2.7901	-.0052	+19 35 58.11	16.274	+0.015
φ Virginis	5.0	K0	14 23 55.458	+3.0891	-.0090	-1 51 23.14	16.225	-0.004
5 Ursæ Minoris	4.4	K2	14 27 40.979	-0.1604	+0.0022	+76 3 54.14	-18.004	+0.021
ρ Boötis	3.8	K0	14 28 15.208	+2.5865	-.0073	+30 44 6.73	15.832	+0.113
γ Boötis	3.0	F0	14 28 44.200	2.4171	-.0091	+38 40 14.90	15.825	+0.145
γ Centauri	2.6	B3p	14 30 13.824	3.7977	-.0032	-41 47 37.92	15.922	-0.082
σ Boötis	4.5	F0	14 31 4.036	2.6131	+0.0150	+30 6 18.60	15.721	+0.125
α Centauri	0.1	G0	14 33 57.052	+4.0561	-.4861	-60 29 36.71	-14.967	+0.723
33 Boötis	5.4	A0	14 35 44.969	2.2341	-.0056	+44 45 43.53	15.635	-0.043
α Apodis	3.8	K5	14 37 28.968	7.3098	-.0088	-78 41 37.47	15.520	-0.024
μ Virginis	4.0	F5	14 38 41.050	3.1588	+0.0071	-5 17 52.80	15.751	-0.322
ε Boötis	2.7	K0p	14 41 21.734	2.6203	-.0035	+27 25 24.57	15.269	+0.009
109 Virginis	3.8	A0	14 42 3.086	+3.0813	-.0074	+2 14 31.17	-15.274	-0.085
8 Libræ	5.3	F5	14 46 5.561	3.3136	-.0073	-15 39 10.04	15.081	-0.074
α Libræ	2.9	A2	14 46 17.008	3.3141	-.0078	-15 41 51.20	15.073	-0.077
α Groombridge 2164	5.7	K2	14 49 19.924	+1.5204	-.0165	+59 37 51.22	14.701	+0.118
β Ursæ Minoris	2.2	K5	14 50 56.060	-0.2026	-.0065	+74 29 40.81	14.721	+0.003
ε Libræ	5.6	K0	14 52 15.680	+3.2507	-.0006	-11 4 31.52	-14.646	-0.001
π Piazzi 221	5.8	A0	14 52 18.093	2.8298	-.0021	+14 46 51.83	14.653	-0.011
β Lupi	2.8	B2p	14 53 5.179	3.9139	-.0070	-42 48 2.05	14.698	-0.063
δ Libræ	var.	A0	14 56 32.093	3.2015	-.0051	-8 11 25.13	14.402	-0.015
β Boötis	3.6	G5	14 58 49.182	2.2900	-.0036	+40 43 2.45	14.287	-0.040
γ Scorpii	3.4	Ma	14 59 12.512	+3.5052	-.0056	-24 57 23.19	-14.271	-0.048
φ Boötis	4.7	K0	15 0 53.334	2.5704	-.0133	+27 16 14.23	14.133	-0.014
c Boötis	5.0	F0	15 3 39.326	2.6347	+0.0136	+25 11 30.10	14.131	-0.184
ζ Lupi	3.5	K0	15 6 18.818	4.2928	-.0126	-51 47 2.64	13.844	-0.066
ι Libræ	4.7	A0p	15 7 29.193	3.4145	-.0031	-19 28 42.58	13.767	-0.063
3 Serpentis	5.4	K0	15 11 3.707	+2.9801	-.0017	+5 14 48.40	-13.478	-0.005
γ Trianguli Australis	3.1	A0	15 11 8.361	5.5554	-.0137	-68 22 27.17	13.510	-0.042
δ Boötis	3.5	K0	15 12 9.406	2.4193	+0.0075	+33 37 25.59	13.526	-0.125
β Libræ	2.7	B8	15 12 32.293	+3.2251	-.0066	-9 4 38.73	13.402	-0.024
γ Ursæ Minoris	3.1	A2	15 20 51.060	-0.1143	-.0020	+72 7 45.49	12.815	+0.013
μ Boötis pr.	4.5	F0	15 21 21.295	+2.2664	-.0121	+37 40 3.51	-12.713	+0.081
τ ¹ Serpentis	5.5	Ma	15 21 56.323	2.7801	-.0024	+15 43 8.76	12.778	-0.024
ι Draconis	3.5	K0	15 23 4.993	1.3336	+0.0014	+59 15 22.97	12.668	+0.010
32 Libræ	5.9	K0	15 23 34.354	3.3790	+0.0006	-16 25 40.70	12.687	-0.043
β Coronæ Borealis	3.7	Fp	15 24 24.423	2.4738	-.0130	+29 23 28.09	12.509	+0.078
π ¹ Boötis	5.2	K5	15 27 56.882	+2.1552	+0.0016	+41 6 55.34	-12.359	-0.014
γ Lupi (mean)	3.0	B3	15 29 36.230	3.9875	-.0020	-40 53 20.03	12.279	-0.049
γ Libræ	4.0	K0	15 30 52.856	3.3526	+0.0047	-14 30 48.31	12.135	+0.006
α Coronæ Borealis	2.3	A0	15 31 10.392	2.5395	+0.0090	+26 59 35.81	12.221	-0.100
ζ Coronæ Borealis seq. †	5.1	B8	15 36 15.152	2.2596	-.0005	+36 54 16.73	11.776	-0.012
α Serpentis	2.8	K0	15 40 10.702	+2.9532	+0.0089	+6 41 9.49	-11.442	+0.042
β Serpentis	3.7	A2	15 42 21.414	2.7686	+0.0054	+15 40 50.67	11.383	-0.055
κ Serpentis	4.3	K5	15 45 0.164	2.6996	-.0035	+18 23 49.35	11.236	-0.099
μ Serpentis	3.6	A0	15 45 17.206	3.1286	-.0058	-3 10 37.38	11.144	-0.028
12 H. Draconis	5.1	A2	15 45 23.868	0.9076	+0.0047	+62 51 20.66	11.176	-0.068
ε Serpentis	3.8	A0	15 46 40.625	+2.9885	+0.0081	+4 43 36.86	-10.945	+0.070
ζ Ursæ Minoris	4.3	A2	15 46 59.691	-2.1997	+0.0082	+78 3 1.37	10.995	-0.004
β Trianguli Australis	3.0	F0	15 47 49.006	+5.2589	-.0290	-63 10 32.92	11.339	-0.406
λ Libræ	5.1	B3	15 48 30.751	3.4777	-.0017	-19 55 12.01	10.926	-0.048
γ Serpentis	3.9	F8	15 52 37.106	2.7698	+0.0212	+15 55 54.25	11.865	-1.289
π Scorpii	3.0	B2p	15 53 49.642	+3.6241	-.0010	-25 52 34.10	-10.535	-0.048
ε Coronæ Borealis	4.2	K0	15 54 9.009	+2.4824	-.0065	+27 7 2.90	-10.530	-0.067

† Virginis, comp. 9=, 4".5 s. l.
 † Boötis, comp. 5=, 1".8 n. pr.

δ Libræ, var., 24.33, 4=, 8-6=, 2
 μ Boötis, star 6=, 7, 108" s.

γ Lupi, binary 3=, 7, 3=, 9, 0".4
 ζ Cor. Bor., comp. 6=, 0, 6".2 n. pr.

α Centauri, dup., 0=, 3, 1=, 7; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page xii remain to be applied to reduce to the position of α¹ Centauri.

226 MEAN PLACES OF TEN-DAY STARS, 1917.

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ' "	"	"
♏ Scorpii	2.5	B1p	15 55 25.331	+3.5426	-.0011	-22 23 11.19	-10.402	-0.035
♑ Draconis	4.1	F8	16 0 19.978	1.1219	-.0091	+58 47 11.79	9.659	+0.339
♏ Scorpii	2.9	B1	16 0 36.440	3.4838	-.0011	-19 34 45.00	10.005	-0.028
♐ Hercules	5.3	G5	16 4 19.637	2.7062	-.0039	+17 16 1.45	9.716	-0.023
Groombridge 2320	5.4	A0	16 6 5.472	0.1536	-.0074	+68 1 43.00	9.506	+0.052
♑ Hercules	4.3	A0	16 6 9.264	+1.8898	-.0017	+45 9 7.12	-9.517	+0.036
♑ Apodis	4.8	Mb	16 7 53.722	8.8602	-.0050	-78 29 20.42	9.474	-0.056
♏ Ophiuchi	3.0	Ma	16 9 59.656	3.1416	-.0031	-3 28 53.21	9.401	-0.144
♏ Coronæ Bor. seq.	5.8	G0	16 11 34.188	+2.2459	-.0223	+34 4 6.39	9.206	-0.071
19 Ursæ Minoris	5.5	B8	16 13 10.417	-1.7458	+0.0007	+76 5 13.09	9.001	+0.008
γ ² Normæ	4.1	K0	16 13 37.194	+4.4728	-.0216	-49 57 11.27	-9.038	-0.064
ε Ophiuchi	3.3	K0	16 13 55.670	3.1790	+0.0054	-4 29 27.83	8.913	+0.037
♏ Scorpii	3.1	B1	16 16 8.421	3.6419	-.0011	-25 23 40.82	8.815	-0.039
♐ Hercules	3.9	B5	16 17 14.756	1.8032	+0.0001	+46 30 37.45	8.660	+0.029
γ Hercules	3.8	F0	16 18 15.476	+2.6455	-.0034	+19 20 49.87	8.573	+0.037
η Ursæ Minoris	5.0	F0	16 19 54.741	-1.7882	-.0231	+75 56 49.54	-8.226	+0.252
γ Apodis	3.9	K0	16 20 40.624	+9.1087	-.0409	-78 42 47.43	8.500	-0.083
ω Hercules	4.5	Ap	16 21 34.845	2.7619	-.0028	+14 13 24.78	8.405	-0.059
η Draconis	2.9	G5	16 22 51.890	0.8082	-.0020	+61 42 6.46	8.186	+0.058
α Scorpii (Antares)	1.2	Map	16 24 18.923	3.6744	-.0006	-26 14 55.76	8.156	-0.028
β Hercules	2.8	K0	16 26 39.031	+2.5775	-.0076	+21 40 10.50	-7.966	-0.025
λ Ophiuchi	3.8	A0	16 26 43.554	+3.0240	-.0022	+2 9 52.94	8.014	-0.079
♑ Draconis	5.0	B8p	16 28 8.325	-0.1289	-.0049	+68 56 51.84	7.785	+0.036
τ Scorpii	2.9	B0	16 30 42.742	+3.7299	-.0013	-28 2 41.64	7.648	-0.034
♐ Hercules	4.2	A0	16 31 25.615	1.9336	-.0006	+42 36 26.80	7.530	+0.026
ζ Ophiuchi	2.7	B0	16 32 35.194	+3.3010	+0.0007	-10 23 59.67	-7.439	+0.022
24 Scorpii	5.0	K0	16 36 46.219	3.4668	-.0017	-17 34 56.80	7.125	-0.004
ζ Hercules	3.0	G0	16 38 9.418	2.2614	-.0364	+31 45 8.88	6.617	+0.390
α Trianguli Australis	1.9	K2	16 39 51.756	6.3253	+0.0028	-68 52 37.47	6.917	-0.049
η Hercules	3.6	K0	16 40 2.984	2.0558	+0.0031	+39 4 45.77	6.945	-0.093
Groombridge 2377	4.9	F0	16 43 43.346	+1.1375	+0.0046	+56 55 47.51	-6.487	+0.062
ε Scorpii	2.4	K0	16 44 47.028	3.8801	-.0505	-34 8 37.71	6.726	-0.264
49 Hercules	6.4	A0	16 48 18.083	2.7303	+0.0010	+15 6 45.09	6.183	-0.014
ε ¹ Aræ	4.2	K2	16 52 57.748	4.7718	-.0011	-53 2 3.96	5.797	-0.017
κ Ophiuchi	3.4	K0	16 53 44.315	2.8383	-.0199	+9 30 11.40	5.726	-0.011
30 Ophiuchi	5.0	K0	16 56 40.999	+3.1630	-.0018	-4 5 56.57	-5.543	-0.076
ε Hercules	3.9	A0	16 57 6.805	2.2947	-.0036	+31 2 52.31	5.408	+0.023
δ Hercules	5.3	A2	16 58 32.416	2.2121	-.0016	+33 41 15.49	5.320	-0.009
η Ophiuchi	2.6	A0	17 5 36.950	3.4376	+0.0017	-15 37 23.24	4.621	+0.091
η Scorpii	3.4	F2	17 6 12.319	4.2926	+0.0023	-43 7 52.14	4.968	-0.306
ζ Draconis	3.2	B5	17 8 32.643	+0.1693	-.0021	+65 49 0.27	-4.445	+0.018
α Hercules	var.	Mb	17 10 51.730	2.7345	-.0008	+14 29 2.46	4.235	+0.029
δ Hercules	3.2	A0	17 11 37.296	2.4632	-.0019	+24 56 10.61	4.358	-0.158
π Hercules	3.4	K2	17 12 9.316	2.0885	-.0025	+36 54 7.14	4.155	-0.001
θ Ophiuchi	3.4	B3	17 16 54.620	3.6819	-.0006	-24 55 4.13	3.782	-0.036
ω Hercules	5.4	G0	17 17 33.166	+2.2430	+0.0096	+32 34 25.28	-4.738	-1.047
β Aræ	2.8	K2	17 18 23.824	4.9813	-.0004	-55 27 9.79	3.646	-0.027
♑ Ophiuchi	4.3	F0	17 21 17.948	3.6610	-.0009	-24 6 0.68	3.506	-0.137
♑ Ophiuchi	4.4	K0	17 22 23.753	2.9757	+0.0002	+4 12 41.90	3.266	+0.008
δ Aræ	3.8	B8	17 23 36.038	5.4063	-.0098	-60 36 59.05	3.290	-0.120
α Aræ	3.0	B3p	17 25 25.373	+4.6332	-.0036	-49 48 42.21	-3.096	-0.063
λ Hercules	4.5	K0	17 27 23.022	2.4241	+0.0016	+26 10 20.76	2.825	+0.018
λ Scorpii	1.7	B2	17 27 58.232	4.0711	-.0004	-37 2 39.60	2.820	-0.027
β Draconis	3.0	G0	17 28 33.393	1.3543	-.0017	+52 21 44.46	2.733	+0.009
α Ophiuchi	2.1	A5	17 31 4.857	2.7838	+0.0080	+12 37 10.14	2.758	-0.235
ε Serpentis	3.6	A5	17 32 49.942	+3.4330	-.0038	-15 20 50.00	-2.431	-0.060
z Hercules	3.8	B3	17 37 7.326	+1.6936	+0.0003	+46 2 59.82	-1.995	+0.003

β Scorpii, comp. 5^m.1, 13^m.3 n. f.
 α Hercules, star 6^m.5, 29^m.7 n. f.
 σ Cor. Bor., comp. 6^m.7, 4^m.6 s. pr.
 ε Scorpii, star 8^m, 21^m pr.
 η Draconis, comp. 8^m, 5^m.4 s. f.

α Scorpii, comp. 7^m, 3^m.2 pr.
 λ Ophiuchi, comp. 6^m, 1^m.2 n. f.
 ζ Hercules, binary, 3^m.0, 6^m.0, 1^m.
 η Oph., binary, 3^m.2, 3^m.7, 0^m.5

α Hercules, var. irreg., 3^m.1-3^m.9, dup.
 comp. 6^m, 4^m.6 s. f.
 δ Hercules, binary, comp. 8^m, 12^m
 s. pr.

MEAN PLACES OF TEN-DAY STARS, 1917. 227

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
♄ Draconis	4.9	F5	17 37 26.140	-0.3540	+0.0014	+68 47 47.02	-1.652	+0.318
♄ Pavonis	3.6	K0	17 37 34.919	+5.8816	+0.0028	-64 41 9.06	2.038	-0.080
♄ Ophiuchi	2.9	K0	17 39 22.313	2.9629	-0.0026	+4 36 3.81	1.644	+0.158
♄ Scorpii	3.1	F5p	17 41 46.752	4.1948	+0.0006	-40 5 45.73	1.000	-0.008
♄ Herculis	3.5	G5	17 43 12.573	+2.3471	-0.0238	+27 46 6.42	2.216	-0.749
♄ Draconis	4.9	F5	17 43 24.658	-1.0738	+0.0024	+72 11 23.68	-1.718	-0.268
♄ Ophiuchi	3.7	A0	17 43 43.813	+3.0073	-0.0016	+2 44 15.38	1.496	-0.073
♄ Herculis	5.5	F2	17 52 4.310	2.4207	+0.0013	+26 3 44.75	0.688	+0.006
♄ Draconis	3.9	K0	17 52 5.684	+1.0361	+0.0131	+56 53 7.24	0.615	+0.077
35 Draconis	5.0	F5	17 53 9.799	-2.6900	+0.0116	+76 58 28.71	0.355	+0.243
♄ Herculis	4.0	K0	17 53 24.377	+2.0571	+0.0006	+37 15 38.91	-0.572	+0.004
♄ Ophiuchi	3.5	K0	17 54 27.394	8.3019	-0.0006	-9 45 51.93	0.604	-0.120
♄ Herculis	3.8	K0	17 54 32.377	2.3315	+0.0072	+29 15 21.90	0.496	-0.018
♄ Draconis	2.4	K5	17 54 40.717	1.3926	-0.0006	+51 29 53.36	0.489	-0.024
67 Ophiuchi	3.9	B5p	17 56 29.302	3.0049	+0.0008	+2 56 4.66	0.320	-0.013
♄ Aræ	3.9	B1	18 0 10.166	+4.6699	-0.0010	-50 5 54.79	-0.036	-0.050
♄ Sagittarii	3.1	K0	18 0 28.482	8.8520	-0.0055	-30 25 34.56	0.156	-0.198
70 Ophiuchi	4.1	K0	18 1 15.559	8.0317	+0.0178	+2 31 3.87	-1.012	-1.122
72 Ophiuchi	3.7	A2	18 3 24.848	2.8433	-0.0045	+9 33 4.42	+0.386	+0.067
♄ Herculis	3.8	A0	18 4 18.259	2.3395	-0.0002	+28 45 0.95	0.378	+0.092
♄ Sagittarii	4.0	B8p	18 8 47.943	+8.5870	-0.0004	-21 4 53.84	+0.768	-0.002
♄ Sagittarii	3.2	M5	18 12 0.696	4.0597	-0.0109	-36 47 15.14	0.898	-0.152
Groombridge 2533	5.4	B5	18 13 3.849	1.8662	-0.0006	-42 7 49.53	1.141	-0.001
36 Draconis	5.0	F5	18 13 25.151	0.3466	+0.0535	+64 22 8.30	1.199	+0.026
♄ Sagittarii	2.8	K0	18 15 40.823	3.8495	+0.0023	-29 51 52.34	1.337	-0.034
♄ Serpentis	3.4	K0	18 17 0.847	+3.1028	-0.0878	-2 55 16.45	+0.796	-0.692
♄ Sagittarii	2.0	A0	18 18 39.755	3.9814	-0.0041	-34 25 29.56	1.508	-0.122
109 Herculis	3.9	K0	18 20 9.641	2.5560	+0.0139	+21 43 51.57	1.500	-0.261
♄ Telescopii	3.8	B3	18 20 49.165	+4.4499	-0.0017	-46 0 55.68	1.750	-0.068
♄ Draconis	3.7	F8	18 22 33.352	-1.0787	+0.1177	+72 41 49.41	1.598	-0.372
♄ Sagittarii	2.9	K0	18 22 50.911	+3.7027	-0.0033	-25 28 7.64	+1.796	-0.199
♄ Serpentis	5.4	G5	18 25 21.795	8.1215	+0.0015	-2 2 23.78	2.179	-0.035
1 Aquilæ	4.1	K0	18 30 41.420	3.2646	-0.0018	-8 18 11.05	2.361	-0.316
♄ Pavonis	4.1	K0	18 33 20.434	7.0190	-0.0057	-71 30 4.20	2.741	-0.168
♄ Lyrae (Vega)	0.1	A0	18 34 7.695	2.0314	+0.0178	+38 42 20.61	3.254	+0.280
2 Aquilæ	4.7	F0	18 37 43.817	+3.2966	+0.0020	-9 7 58.66	+3.279	-0.006
♄ Sagittarii	3.3	B8	18 40 28.264	3.7488	+0.0034	-27 4 37.80	8.515	-0.006
110 Herculis	4.3	F5	18 42 5.321	2.5804	-0.0019	+20 27 57.52	3.317	-0.344
6 Aquilæ	4.5	G0	18 42 46.231	3.1839	-0.0009	-4 50 15.57	3.696	-0.023
♄ Pavonis	4.4	B2	18 44 31.787	5.5685	-0.0030	-62 17 3.04	3.848	-0.022
♄ Lyrae	var.	B2p	18 47 0.919	+2.2148	+0.0004	+33 15 56.11	+4.078	-0.005
50 Draconis	5.4	A0	18 49 3.584	-1.9211	-0.0031	+75 20 11.11	4.309	+0.051
♄ Draconis	4.8	K0	18 49 58.730	+0.8840	+0.0116	+59 17 11.75	4.360	+0.023
♄ Sagittarii	2.1	B3	18 50 7.114	3.7200	-0.0008	-26 24 8.66	4.274	-0.075
♄ Serpentis pr. . . .	4.5	A5	18 52 5.582	2.9832	+0.0027	+4 5 40.76	4.545	+0.028
R Lyrae	var.	Mb	18 52 48.588	+1.8260	+0.0026	+43 50 10.20	+4.656	+0.078
♄ Lyrae	3.3	A0	18 55 50.298	2.2435	-0.0006	+32 34 29.74	4.330	-0.006
♄ Aquilæ	4.2	K0	18 55 51.301	2.7221	-0.0042	+14 57 16.73	4.766	-0.081
♄ Sagittarii	2.7	A2	18 57 19.884	3.8178	-0.0024	-30 0 0.26	4.943	-0.019
♄ Aquilæ	3.0	A0	19 1 35.698	2.7569	-0.0008	+13 44 21.13	5.224	-0.099
♄ Aquilæ	3.6	A0	19 1 50.651	+3.1835	-0.0020	-5 0 28.20	+5.261	-0.083
♄ Coronæ Australis	4.1	A2	19 3 49.557	4.0829	+0.0051	-38 2 6.34	5.393	-0.118
♄ Lyrae	5.1	B5	19 4 20.420	2.1413	+0.0005	+35 58 9.57	5.548	-0.006
♄ Sagittarii	3.0	F2	19 4 49.713	3.5688	-0.0005	-21 9 23.62	5.559	-0.036
♄ Sagittarii	4.9	F5	19 10 27.129	3.6800	+0.0025	-25 24 2.96	6.030	-0.035
♄ Draconis	3.2	K0	19 12 32.414	+0.0218	+0.0175	+67 30 55.85	+6.327	+0.088
d Sagittarii	5.0	K0	19 12 46.758	+3.5108	-0.0015	-19 6 5.88	+6.243	-0.017

♄ Draconis, star 6^m.1, 30^s.4 n. f.
70 Ophiuchi, comp. 6^m, 2^s.1 s.

♄ Lyrae, var., 124.9, 3^m.4-4^m.1, star
7^m, 46^s.1 s. f.
♄ Draco, star 7^m.6, 32^s.1 n. pr.

♄ Serpentis, star 5^m.4, 22^s.2 s. f.
R Lyrae, var., 46.4, 4^m.0-4^m.7.
♄ Sag., binary, 3^m.4, 3^m.6, 0^s.5.

228 MEAN PLACES OF TEN-DAY STARS, 1917.

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
θ Lyrae	4.5	K0	19 13 29.188	+2.0808	-.0015	+37 59 7.19	+ 6.234	+0.008
ω Aquilæ	5.1	A5	19 13 55.236	2.8158	-.0002	+11 26 41.49	6.368	+0.014
κ Cygni	4.0	K0	19 15 11.130	+1.3878	-.0071	+53 12 53.51	6.580	+0.121
τ Draconis	4.6	K0	19 17 9.537	-1.1368	-.0812	+73 12 6.36	6.781	+0.109
δ Aquilæ	3.4	F0	19 21 18.819	+3.0249	+0.0168	+ 2 56 54.21	7.045	+0.081
β Cygni	3.2	K0p	19 27 22.426	+2.4189	-.0002	+27 47 4.40	+ 7.448	-0.010
ι Cygni	3.9	A2	19 27 36.836	1.5182	+0.0023	+51 33 8.92	7.006	+0.129
μ Aquilæ	4.6	K0	19 30 2.113	2.9312	+0.0145	+ 7 12 7.10	7.528	-0.146
λ Sagittarii	4.7	B9	19 31 39.459	3.6538	+0.0045	-25 4 4.19	7.778	-0.027
κ Aquilæ	5.0	B0	19 32 25.638	3.2287	+0.0005	- 7 12 46.14	7.869	+0.002
θ Cygni	4.6	F5	19 34 12.963	+1.0089	-.0024	+50 1 42.06	+ 3.391	+0.250
54 Sagittarii	5.4	K0	19 35 58.167	3.4386	+0.0046	-16 29 4.31	8.104	-0.047
β Sagittæ	4.4	K0	19 37 19.243	2.6989	+0.0001	+17 16 58.87	8.227	-0.082
15 Cygni	5.0	K0	19 41 17.033	2.1640	+0.0068	+37 9 12.00	8.614	+0.040
γ Sagittarii	5.1	K0	19 41 31.295	3.5013	-.0099	-19 57 41.56	8.504	-0.083
γ Aquilæ	2.8	K2	19 42 18.817	+3.8519	+0.0007	+10 24 36.48	+ 3.651	-0.002
δ Cygni	3.0	A0	19 42 22.897	1.8760	+0.0055	+44 55 39.24	8.704	+0.044
δ Sagittæ	3.8	Map	19 43 41.215	2.6749	+0.0004	+18 19 43.62	8.780	+0.017
α Aquilæ (<i>Altair</i>)	0.9	A5	19 46 44.024	2.9271	+0.0860	+ 8 38 53.59	9.380	+0.379
η Aquilæ	var.	G0	19 48 14.719	+3.0567	+0.0005	+ 0 47 30.35	9.111	-0.008
ε Draconis	4.0	K0	19 48 27.750	-0.1885	+0.0170	+70 3 23.40	+ 9.164	+0.027
ι Sagittarii	4.2	K0	19 49 32.212	+4.1427	-.0017	-42 5 14.69	9.265	+0.045
ε Pavonis	4.1	A0	19 51 0.707	6.9839	+0.0112	-73 7 51.67	9.215	-0.120
β Aquilæ	3.9	K0	19 51 14.175	2.9468	+0.0025	+ 6 11 55.08	8.871	-0.481
γ Sagittæ	3.7	K5	19 55 3.931	2.6673	+0.0041	+19 15 57.45	9.672	+0.025
ε Sagittarii	4.6	Mb	19 57 33.406	+3.6926	+0.0028	-27 56 29.64	+ 9.851	+0.013
τ Aquilæ	3.6	K0	20 0 5.136	2.9307	+0.0010	+ 7 2 35.37	10.059	+0.029
θ Aquilæ	3.4	A0	20 7 1.371	3.0959	+0.0020	- 1 4 6.48	10.555	+0.008
o Cygni seq.	4.0	K0p	20 11 1.132	+1.8901	+0.0014	+46 29 20.71	10.851	+0.005
κ Cephei	4.4	B9	20 11 42.531	-1.9687	+0.0025	+77 27 43.18	10.922	+0.026
24 Vulpeculæ	5.4	K0	20 13 14.008	+2.5674	+0.0017	+24 24 53.00	+10.996	-0.012
α ² Capricorni	3.8	K0	20 13 27.046	3.3303	+0.0040	-12 48 10.54	11.082	+0.008
β Capricorni	3.2	G0p	20 16 21.000	3.3732	+0.0030	-15 2 39.49	11.341	+0.007
α Pavonis	2.1	B3	20 19 5.338	4.7631	.0000	-57 0 7.87	11.340	-0.092
γ Cygni	2.3	F8p	20 19 14.948	2.1527	+0.0004	+39 59 25.47	11.444	+0.001
π Capricorni	5.2	B8	20 22 34.314	+3.4361	+0.0004	-18 29 4.29	+11.679	-0.002
ρ Capricorni	5.0	F0	20 24 7.690	3.4244	-.0013	-18 5 20.02	11.771	-0.020
41 Cygni	4.1	F5	20 26 0.298	3.4516	+0.0014	+30 5 27.48	11.922	-0.002
θ Cephei	4.3	A5	20 28 11.516	1.0114	+0.0066	+62 42 53.24	12.059	-0.018
ε Delphini	4.0	B5	20 29 14.877	+2.8664	+0.0007	+11 1 13.40	12.126	-0.025
Groombridge 3241	6.4	K2	20 30 22.523	-0.2401	-.0047	+72 15 2.00	+12.210	-0.018
α Indi	3.2	K0	20 31 43.960	+4.2290	+0.0027	-47 34 55.24	12.376	+0.053
β Delphini	3.7	F5	20 33 39.453	2.8188	+0.0082	+14 18 20.44	12.420	-0.085
ν Capricorni	5.3	Ma	20 35 19.605	3.4178	-.0018	-18 25 53.45	12.562	-0.007
α Delphini	3.9	B8	20 35 46.988	2.7868	+0.0047	+15 37 7.61	12.617	+0.017
β Pavonis	3.6	A5	20 37 29.681	+5.4409	-.0079	-66 30 9.90	+12.713	-0.003
α Cygni (<i>Deneb</i>)	1.3	A2p	20 38 36.119	2.0448	+0.0004	+44 58 59.39	12.789	-0.002
δ Delphini	4.5	A2	20 39 35.044	2.8008	-.0014	+14 46 33.59	12.807	-0.050
ψ Capricorni	4.3	F8	20 41 11.051	3.5563	-.0041	-25 34 11.19	12.816	-0.148
γ Delphini seq.	4.5	G5	20 42 48.447	2.7832	-.0028	+15 49 28.19	12.876	-0.196
ε Cygni	2.6	K0	20 42 51.169	+2.4275	+0.0294	+33 39 31.48	+13.401	+0.326
ε Aquarii	3.8	A0	20 43 11.054	3.2491	+0.0017	- 9 48 1.17	13.067	-0.030
η Cephei	3.6	K0	20 43 36.226	1.2243	+0.0132	+61 30 58.03	13.945	+0.320
μ Aquarii	4.8	A3	20 48 10.706	3.2376	+0.0025	- 9 17 44.18	13.396	-0.089
β Indi	3.7	K0	20 48 19.977	4.7101	+0.0018	-58 46 4.98	13.426	-0.008
32 Vulpeculæ	5.2	K2	20 51 1.338	+2.5563	-.0003	+27 44 28.91	+13.613	+0.004

β Cygni, star 5=4, 34'' 7 n. f.
 δ Cygni, comp. 8=, 1'' 6 n. pr.
 η Aquilæ, var., 74.18, 3=, 7-4=, 4
 ε Draconis, comp. 7=6, 3'' 1 n.

o Cygni, star 5=0 pr. 19=, 270'' n.,
 star 7=8 f. 1=, 96'' s.
 κ Cephei, comp. 8=, 7'' 5 s. f.
 α² Capricorn., α¹ Capricorn. 4=6 pr. 24=,
 137'' n.

β Capricorn., star 6=2 pr. 14=, 10'' s.
 ω Capricorn., comp. 9=, 3'' 4 s. f.
 ρ Capricorn., comp. 7=6, 3'' 8 s.
 β Delphini, binary 4=1, 5=4, 0'' 5
 γ Delphini, comp. 5=5, 11'' 3 pr.

MEAN PLACES OF TEN-DAY STARS, 1917. 229

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
220 H ¹ . Draconis . . .	5.6	K0	20 51 23.721	-2.6848	-0.106	+80 14 30.34	+13.807	-0.025
γ Cygni . . .	4.0	A0	20 54 4.689	+2.2856	+0.008	+40 50 49.17	13.786	-0.018
α Octantis . . .	5.2	F2	20 54 42.416	7.3755	-0.007	-77 20 31.45	13.454	-0.389
γ Microscopii . . .	4.7	G5	20 56 12.259	3.6861	-0.004	-32 34 58.56	13.933	-0.004
θ Capricorni . . .	4.2	A0	21 1 17.001	3.3751	+0.031	-17 33 48.54	14.187	-0.066
ξ Cygni . . .	3.9	K5	21 1 54.674	+2.1814	+0.009	+43 35 46.67	+14.300	+0.008
61 Cygni pr. . .	5.6	K5	21 3 10.466	2.6853	+3.496	+38 20 26.13	17.618	+3.249
61 Cygni seq. . .	6.3	K5	Δα + 1.499	.....	.....	Δδ -15.64	.....	.....
ν Aquarii . . .	4.5	K0	21 5 4.447	+3.2698	+0.067	-11 42 30.02	14.479	-0.006
Bradley 2777 . . .	5.9	A	21 7 11.200	-1.1450	+0.102	+77 47 24.11	14.641	+0.029
3 Piscis Australis . . .	5.6	K5	21 8 22.207	+3.5630	+0.075	-27 57 30.84	+14.576	-0.106
ζ Cygni . . .	3.4	K0	21 9 24.176	2.5523	-0.002	+29 53 9.03	14.683	-0.061
τ Cygni . . .	3.8	F0	21 11 28.636	2.3941	+0.141	+37 41 26.11	15.300	+0.434
α Equulei . . .	4.1	F8p	21 11 40.506	2.9092	+0.084	+ 4 54 14.60	14.792	-0.085
σ Cygni . . .	4.3	A0p	21 14 9.301	2.3549	-0.001	+39 2 47.12	15.025	+0.003
θ Microscopii . . .	4.9	A2p	21 15 27.288	+3.3440	+0.028	-41 9 40.04	+15.102	+0.005
α Capricorni . . .	2.6	A5	21 16 36.023	1.4348	+0.024	+62 14 0.93	15.212	+0.050
ι Capricorni . . .	4.3	K0	21 17 37.651	3.3438	+0.022	-17 11 19.32	15.225	+0.004
1 Pegasi . . .	4.2	K0	21 18 14.864	2.7741	+0.075	+19 26 55.70	15.321	+0.064
γ Pavonis . . .	4.3	F8	21 19 35.870	4.9983	+0.154	-65 44 34.26	16.117	+0.784
ζ Capricorni . . .	3.9	G5p	21 21 55.893	+3.4300	+0.004	-22 46 17.40	+15.484	+0.020
g Cygni . . .	5.3	K0	21 26 23.141	2.2128	+0.050	+46 10 27.13	15.814	+0.105
β Aquarii . . .	3.1	G0	21 27 11.442	3.1598	+0.012	- 5 56 13.11	15.742	-0.011
β Cephei . . .	3.3	B1	21 27 35.732	0.7853	+0.096	+70 11 46.22	15.780	+0.005
ξ Aquarii . . .	4.8	A5	21 33 20.090	3.1956	+0.075	- 8 13 37.29	16.056	-0.023
74 Cygni . . .	5.1	A5	21 33 37.291	+2.4085	+0.008	+40 2 24.51	+16.108	+0.009
γ Capricorni . . .	3.8	F0p	21 35 29.676	3.3270	+0.129	-17 2 15.90	16.174	-0.017
ε Pegasi . . .	2.5	K0	21 40 6.553	2.9461	+0.016	+ 9 29 37.98	16.425	0.000
11 Cephei . . .	4.8	K0	21 40 42.615	0.8874	+0.021	+70 55 44.50	16.549	+0.093
δ Capricorni . . .	3.0	A5	21 42 27.698	3.3139	+0.176	-16 30 16.26	16.246	-0.297
π Cygni . . .	4.3	B3	21 43 43.539	+2.2147	+0.009	+48 55 30.44	+16.804	-0.001
μ Capricorni . . .	5.2	F0	21 48 46.341	3.2728	+0.004	-13 56 35.42	16.849	+0.001
γ Grus . . .	3.2	B8	21 48 54.415	3.6406	+0.077	-37 45 21.18	16.834	-0.021
16 Pegasi . . .	5.0	B3	21 49 17.082	2.7285	+0.005	+25 32 3.21	16.878	+0.006
79 Draconis . . .	6.6	A0	21 51 49.247	0.7179	+0.100	+73 18 33.99	17.007	+0.016
ε Indi . . .	4.7	K5	21 57 1.104	+4.8081	+4.783	-57 7 39.60	+14.655	-2.572
20 Pegasi . . .	5.7	F2	21 57 2.716	2.9222	+0.088	+12 43 18.54	17.176	-0.054
α Aquarii . . .	3.2	G0	22 1 31.295	3.0830	+0.010	- 0 43 24.62	17.424	-0.002
ι Aquarii . . .	4.4	B8	22 1 57.362	3.2423	+0.022	-14 16 22.40	17.383	-0.082
20 Cephei . . .	5.4	K5	22 2 29.121	1.8229	+0.032	+62 22 49.19	17.519	+0.051
α Grus . . .	2.2	B5	22 3 0.476	+3.7928	+0.110	-47 21 49.43	+17.315	-0.174
ι Pegasi . . .	4.0	F5	22 3 8.777	2.7916	+0.022	+24 56 21.20	17.516	+0.020
θ Pegasi . . .	3.7	A0	22 6 0.805	3.0267	+0.0187	+ 5 47 20.84	17.652	+0.036
π Pegasi . . .	4.4	F5	22 6 17.996	2.6628	-0.003	+32 46 13.86	17.610	-0.018
ζ Cephei . . .	3.6	K0	22 7 58.365	2.0783	+0.018	+57 47 30.65	17.708	+0.010
24 Cephei . . .	5.0	G5	22 8 12.885	+1.1573	+0.044	+71 55 55.62	+17.711	+0.004
θ Aquarii . . .	4.3	K0	22 12 27.295	3.1671	+0.074	- 8 11 49.13	17.860	-0.019
α Tucanae . . .	2.9	K2	22 12 49.495	4.1382	-0.118	-60 40 25.05	17.859	-0.035
γ Aquarii . . .	4.0	A0	22 17 22.185	3.0990	+0.061	- 1 48 21.22	18.084	+0.015
31 Pegasi . . .	1.9	B3p	22 17 25.960	2.9530	+0.010	+11 47 11.51	18.078	+0.007
3 Lacertae . . .	4.6	K0	22 20 17.636	+2.3559	-0.007	+51 48 46.37	+17.990	-0.188
π Aquarii . . .	4.6	B1	22 21 2.291	3.0687	+0.004	+ 0 57 20.70	18.204	-0.001
σ Aquarii . . .	4.9	A0	22 26 15.390	3.1769	0.000	-11 6 10.87	18.266	-0.026
α Lacertae . . .	3.8	A0	22 27 52.200	2.4684	+0.157	+49 51 19.43	18.461	+0.014
ν Aquarii . . .	5.3	F5	22 30 9.299	3.2848	+0.148	-21 8 2.09	18.370	-0.154
226 B. Cephei . . .	5.7	A0	22 30 49.232	+1.0641	-0.052	+75 47 55.01	+18.547	0.000

γ Cygni, comp. 7^m, 0^m.8

g Cygni, star 6^m 7.1 10^m, 420^m s.

β Cephei, star 8^m, 13^m.3 s. pr.

230 MEAN PLACES OF TEN-DAY STARS, 1917.

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h	m	s	s	s	° ' "	"	"
η Aquarii	4.1	B8	22 31	5.504		+3.0831	+0.0067	- 0 32 44.30	+18.503	-0.053
10 Lacertæ	4.9	Oe5	22 35	32.103		2.6892	+0.0011	+38 37 4.45	18.688	-0.011
ε Piscis Australis	4.2	B8	22 36	4.046		3.3223	+0.0008	-27 28 37.50	18.705	-0.011
ζ Pegasi	3.6	B8	22 37	19.326		2.9915	+0.0064	+10 23 51.67	18.741	-0.014
β Gruis	2.2	Mb	22 37	43.040		3.5961	+0.0133	-47 19 8.97	18.741	-0.026
γ Pegasi	3.1	G0	22 39	6.566		+2.8094	+0.0011	+29 47 12.05	+18.772	-0.037
λ Pegasi	4.1	K0	22 42	31.883		2.8871	+0.0037	+23 7 42.77	18.902	-0.009
ε Gruis	3.7	A2	22 43	32.835		3.6371	+0.0093	-51 45 12.77	18.882	-0.059
τ Aquarii	4.2	K5	22 45	11.957		3.1799	-0.0008	-14 1 51.42	18.954	-0.033
μ Pegasi	3.7	K0	22 45	59.749		2.8934	+0.0110	+24 9 46.83	18.968	-0.042
ι Cephei	3.7	K0	22 46	43.309		+2.1285	-0.0111	+65 45 48.98	+18.903	-0.126
λ Aquarii	3.8	Ma	22 48	17.113		3.1308	+0.0002	- 8 1 17.70	19.107	+0.035
ρ Indi	6.1	G5	22 48	53.950		4.2126	-0.0133	-70 31 3.03	19.142	+0.053
δ Aquarii	3.5	A2	22 50	14.807		3.1861	-0.0034	-16 15 45.11	19.098	-0.026
α Pisc. Aust. (<i>Fomalhaut</i>)	1.3	A3	22 53	4.049		3.3205	+0.0252	-30 3 44.98	19.025	-0.171
ο Andromedæ	3.6	B5p	22 58	5.916		+2.7549	+0.0020	+41 52 46.70	+19.309	-0.010
β Pegasi	† var.	Ma	22 59	44.908		2.9054	+0.0146	+27 37 56.23	19.492	+0.135
α Pegasi (<i>Markab</i>)	2.6	A0	23 0	37.503		2.9865	+0.0040	+14 45 30.41	19.337	-0.039
55 Pegasi	4.7	Ma	23 2	49.342		3.0209	+0.0003	+ 8 57 38.97	19.413	-0.012
ε ² Aquarii	3.8	K0	23 5	1.376		3.2017	+0.0032	-21 37 23.65	19.512	+0.041
π Cephei	† 4.6	G5	23 5	15.234		+1.8999	+0.0023	+74 56 19.07	+19.444	-0.032
ι Gruis	4.1	K0	23 5	39.922		3.4064	+0.0121	-45 41 47.69	19.454	-0.031
59 Pegasi	5.2	A3	23 7	32.720		3.0279	-0.0007	+ 8 16 9.18	19.527	+0.004
5 H ¹ . Cassiopeiæ	5.6	K2	23 9	16.897		2.8795	+0.2536	+56 42 35.99	19.855	+0.299
φ Aquarii	4.4	Ma	23 10	1.450		3.1071	+0.0015	- 6 29 48.06	19.376	-0.194
ψ Aquarii	† 4.5	K0	23 11	32.666		+3.1447	+0.0250	- 9 32 23.99	+19.594	-0.005
γ Tucanæ	4.1	F2	23 12	35.551		3.5182	-0.0057	-58 41 28.76	19.678	+0.060
γ Piscium	3.8	K0	23 12	51.731		3.1094	+0.0502	+ 2 49 42.94	19.643	+0.021
γ Sculptoris	4.5	K0	23 14	20.684		3.2444	+0.0002	-32 59 3.88	19.583	-0.066
ο Cephei	† 4.9	G5	23 15	12.670		2.4526	+0.0113	+67 39 26.07	19.682	+0.018
τ Pegasi	4.6	A5	23 16	31.586		+2.9690	+0.0018	+23 17 8.86	+19.674	-0.012
δ ¹ Aquarii	4.2	K0	23 18	36.761		3.1528	-0.0099	-20 33 14.07	19.630	-0.089
4 Cassiopeiæ	5.2	K5	23 21	8.592		2.6512	-0.0004	+61 49 37.20	19.748	-0.010
ν Pegasi	4.6	G0	23 21	14.067		2.9908	+0.0134	+22 56 48.93	19.790	+0.030
κ Piscium	4.9	A2p	23 22	40.659		3.0752	+0.0056	+ 0 48 4.07	19.688	-0.093
θ Piscium	4.4	G5	23 23	45.418		+3.0421	-0.0088	+ 5 55 22.75	+19.754	-0.041
70 Pegasi	4.7	K0	23 24	57.338		3.0322	+0.0040	+12 18 9.10	19.847	+0.035
β Sculptoris	4.5	B9	23 28	31.456		3.2242	+0.0071	-38 16 39.40	19.862	+0.006
72 Pegasi (<i>mean</i>)	† 5.2	K2	23 29	49.929		2.9713	+0.0035	+30 52 1.86	19.862	-0.009
λ Andromedæ	4.0	K0	23 33	29.829		2.9287	+0.0158	+46 0 30.22	19.492	-0.420
ι Andromedæ	4.3	B8	23 34	3.667		+2.9353	+0.0025	+42 48 30.57	+19.917	0.000
ι Piscium	4.3	G0	23 35	40.825		3.0845	+0.0246	+ 5 10 34.77	19.497	-0.436
γ Cephei	3.4	K0	23 35	55.858		2.4403	-0.0173	+77 10 8.83	20.092	+0.157
κ Andromedæ	4.3	A0	23 36	18.934		2.9479	+0.0078	+43 52 27.14	19.914	-0.024
ω ² Aquarii	4.6	A0	23 38	25.143		3.1126	+0.0063	-15 0 13.76	19.894	-0.063
ε ¹ Aquarii	5.3	B8	23 39	53.896		+3.1143	+0.0019	-18 44 15.92	+19.963	-0.006
ψ Andromedæ	5.1	K0	23 41	54.967		2.9643	+0.0005	+45 57 33.59	19.975	-0.008
41 ¹ H. Cephei	5.0	A0	23 43	55.971		2.8507	+0.0024	+67 20 43.89	19.986	-0.010
δ Sculptoris	4.6	A0	23 44	36.240		3.1274	+0.0059	-28 35 22.88	19.867	-0.133
φ Pegasi	5.2	Ma	23 48	15.780		3.0482	-0.0013	+18 39 33.40	19.980	-0.039
ρ Cassiopeiæ	4.8	F8p	23 50	13.711		+2.9826	-0.0022	+57 2 15.48	+20.029	+0.002
γ Groenbridge 4163	6.6	B9	23 50	46.464		2.8818	-0.0040	+73 56 54.22	20.025	-0.005
ω Piscium	4.0	F5	23 55	2.897		3.0796	+0.0102	+ 6 24 13.92	19.933	-0.108
ε Tucanæ	4.7	B9	23 55	36.742		3.1378	+0.0076	-66 2 19.02	20.024	-0.007
30 Piscium	4.7	Mb	23 57	42.213		3.0771	+0.0030	- 6 28 31.21	20.097	-0.037
2 Ceti	4.6	A0	23 59	29.839		+3.0751	+0.0015	-17 47 53.22	+20.032	-0.013

β Pegasi, var. irreg.; 2^m.2-2^m.7
 π Cephei, comp. 7^m, 0^m.9 f.

ψ Aquarii, star 8^m.5, 40^m.4 n. pr.
 ο Cephei, comp. 8^m, 2^m.9 s. pr.

72 Pegasi, binary, 6^m.0, 6^m.0, 9^m.4

MEAN PLACES OF CIRCUMPOLAR STARS, 1917. 231

FOR JANUARY 0^d.217, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			<i>h m s</i>	<i>s</i>	<i>s</i>	<i>° ' "</i>	<i>"</i>	<i>"</i>
43 H. Cephei	4.5	K0	0 57 9.300	+ 7.5506	+0.730	+85 48 45.30	+19.421	-0.004
α Ursæ Min. (<i>Polaris</i>)	2.1	F8	1 30 13.156	+29.0262	+1.172	+88 51 43.55	+18.514	+0.002
4 G. Octantis	5.6	K0	1 42 2.339	- 3.7571	+0.086	-85 11 21.46	+18.119	+0.028
Groombridge 750	6.7	F8	4 10 2.561	+17.6173	+0.128	+85 20 10.34	+ 9.295	+0.042
Groombridge 944	6.4	K0	5 35 12.782	+18.7703	+0.130	+85 9 30.24	+ 2.160	-0.004
31 G. Mensæ	6.2	A0	5 46 14.756	-11.6820	-0.128	-84 49 46.89	+ 1.289	+0.087
ζ Mensæ	5.6	A2	6 46 58.546	- 4.9448	-0.086	-80 43 38.16	- 8.998	+0.082
51 H. Cephei	5.3	Ma	7 2 4.048	+29.1731	-0.078	+87 10 54.74	- 5.397	-0.085
25 H. Camelopardalis	5.1	Mb	7 13 42.294	+12.8146	+0.132	+82 34 30.13	- 6.333	-0.047
7 G. Octantis	6.4	F5	7 16 20.292	-20.2749	-0.146	-86 54 6.70	- 6.548	+0.005
Groombridge 1119	7.0	A0	8 15 48.380	+59.9071	-0.404	+88 53 0.29	-11.178	+0.017
ζ Octantis	5.4	A3	9 8 57.938	- 8.1549	-0.147	-85 19 57.45	-14.675	+0.043
1 H. Draconis	4.6	K0	9 25 21.719	+ 8.7866	-0.059	+81 41 41.50	-15.680	-0.027
ζ Chamaeleontis	5.2	B3	9 36 22.347	- 1.6575	-0.121	-80 34 6.83	-16.217	+0.019
30 H. Camelopardalis	5.3	F5	10 21 4.831	+ 7.5676	-0.062	+82 58 54.07	-18.198	+0.009
η Octantis	6.3	A0	10 59 55.280	- 0.3633	-0.074	-84 8 50.60	-19.885	-0.005
Bradley 1672	6.3	F0	12 14 28.425	+ 0.3756	-0.716	+88 9 36.08	-19.947	+0.058
γ Octantis	5.4	K0	12 46 7.152	+ 5.9739	+0.066	-84 40 22.34	-19.617	+0.024
32 H. Camelop. seq.	5.3	A2	12 48 30.418	+ 0.4429	-0.184	+83 51 50.47	-19.582	+0.016
κ Octantis	5.6	A2	13 27 14.624	+ 9.1162	-0.764	-85 21 42.23	-18.634	-0.024
δ Octantis	4.1	K2	14 13 27.793	+ 9.2680	-0.011	-83 17 21.03	-16.756	-0.014
Groombridge 2283	7.2	K0	15 3 41.175	-19.3982	-0.066	+87 33 10.52	-13.914	+0.031
η Octantis	5.7	A2	15 23 56.594	+13.3645	+0.042	-84 11 30.39	-12.539	+0.080
ϵ Ursæ Minoris	4.4	G5	16 54 25.488	- 6.2513	+0.067	+82 10 32.75	- 5.668	-0.001
59 G. Apodis	5.9	Mb	17 15 54.896	+11.1669	+0.086	-80 47 6.56	- 3.871	-0.039
δ Ursæ Minoris	4.4	A0	17 59 1.307	-19.4978	+0.175	+86 36 51.17	- 0.038	+0.048
γ Octantis	5.2	K0	18 6 11.893	+35.7286	-0.067	-87 39 51.82	+ 0.416	-0.127
λ Ursæ Minoris	6.6	Mb	19 2 39.624	-72.0496	-0.1103	+89 1 2.17	+ 5.418	+0.006
ϵ Octantis	5.5	F0	19 27 42.218	+94.7793	+0.1084	-89 13 28.57	+ 7.485	-0.001
76 Draconis	5.7	A0	20 48 40.494	- 4.1683	+0.131	+82 13 29.86	+13.482	+0.025
λ Octantis	5.4	G0p	21 38 19.542	+ 9.5134	+0.089	-83 6 6.99	+16.328	-0.012
ν Octantis	5.7	K0	22 16 8.656	+12.3064	-0.400	-86 23 27.13	+18.097	+0.074
β Octantis	4.3	F0	22 37 39.016	+ 6.3104	-0.0302	-81 49 2.34	+18.767	+0.002
39 H. Cephei	5.6	F0	23 27 44.125	- 0.2705	+0.0639	+86 50 58.89	+19.867	+0.020
γ^1 Octantis	5.1	G5	23 47 16.424	+ 3.6100	-0.0247	-82 28 48.42	+20.003	-0.012

α Ursæ Min., star 9^m, 18^s s. pr. | δ H. Camelop., star 5^m, 19^s.8 s. pr. | λ Octantis, binary, 5^m.5, 9^m.0, 3^s.2 n. f.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 0 57	° ' " +85 49	Jan.	h m 1 29	° ' " +88 52	Jan.	h m 1 41	° ' " -85 11	Jan.	h m 4 10	° ' " +85 20	Jan.	h m 5 35	° ' " +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.3	10.94	12.49	0.3	89.73	10.50	0.3	67.69	34.01	0.4	20.66	27.91	0.5	34.20	39.06
1.3	10.68	12.55	1.3	88.81	10.59	1.3	67.40	34.06	1.4	20.55	28.15	1.5	34.17	39.33
2.3	10.44	12.60	2.3	87.93	10.69	2.3	67.09	34.11	2.4	20.45	28.38	2.4	34.16	39.61
3.3	10.21	12.66	3.3	87.07	10.80	3.3	66.77	34.16	3.4	20.36	28.62	3.4	34.15	39.88
4.3	9.97	12.75	4.3	86.20	10.92	4.3	66.49	34.15	4.4	20.27	28.88	4.4	34.15	40.16
5.3	9.71	12.81	5.3	85.28	11.03	5.3	66.19	34.12	5.4	20.17	29.15	5.4	34.15	40.45
6.2	9.44	12.88	6.3	84.28	11.16	6.3	65.91	34.08	6.4	20.07	29.44	6.4	34.15	40.77
7.2	9.16	12.95	7.3	83.23	11.29	7.3	65.63	34.03	7.4	19.95	29.74	7.4	34.12	41.10
8.2	8.85	13.01	8.3	82.12	11.40	8.3	65.38	33.99	8.4	19.81	30.03	8.4	34.08	41.44
9.2	8.53	13.06	9.3	80.97	11.51	9.3	65.13	33.94	9.4	19.66	30.31	9.4	34.03	41.78
10.2	8.20	13.08	10.3	79.80	11.57	10.3	64.88	33.91	10.4	19.49	30.59	10.4	33.97	42.11
11.2	7.90	13.09	11.3	78.62	11.63	11.3	64.63	33.88	11.4	19.31	30.84	11.4	33.88	42.43
12.2	7.59	13.06	12.3	77.45	11.68	12.3	64.37	33.85	12.4	19.12	31.08	12.4	33.78	42.74
13.2	7.28	13.02	13.2	76.31	11.69	13.3	64.11	33.84	13.4	18.92	31.29	13.4	33.67	43.04
14.2	6.99	12.97	14.2	75.22	11.70	14.3	63.83	33.84	14.4	18.73	31.49	14.4	33.56	43.31
15.2	6.72	12.92	15.2	74.19	11.69	15.3	63.54	33.83	15.4	18.54	31.68	15.4	33.45	43.56
16.2	6.47	12.88	16.2	73.22	11.69	16.2	63.25	33.79	16.4	18.38	31.86	16.4	33.36	43.80
17.2	6.23	12.85	17.2	72.29	11.70	17.2	62.93	33.72	17.3	18.23	32.03	17.4	33.27	44.04
18.2	5.99	12.83	18.2	71.39	11.73	18.2	62.63	33.64	18.3	18.08	32.21	18.4	33.20	44.27
19.2	5.75	12.83	19.2	70.46	11.78	19.2	62.32	33.53	19.3	17.94	32.43	19.4	33.14	44.53
20.2	5.49	12.82	20.2	69.49	11.83	20.2	62.03	33.38	20.3	17.80	32.65	20.4	33.09	44.80
21.2	5.22	12.83	21.2	68.44	11.89	21.2	61.76	33.23	21.3	17.63	32.88	21.4	33.01	45.09
22.2	4.94	12.81	22.2	67.31	11.94	22.2	61.52	33.09	22.3	17.46	33.11	22.4	32.93	45.40
23.2	4.61	12.77	23.2	66.12	11.96	23.2	61.27	32.94	23.3	17.27	33.35	23.4	32.83	45.72
24.2	4.29	12.72	24.2	64.91	11.94	24.2	61.03	32.81	24.3	17.04	33.56	24.4	32.69	46.03
25.2	3.97	12.62	25.2	63.71	11.90	25.2	60.80	32.69	25.3	16.81	33.75	25.4	32.54	46.31
26.2	3.68	12.50	26.2	62.55	11.84	26.2	60.54	32.59	26.3	16.57	33.91	26.4	32.36	46.55
27.2	3.40	12.36	27.2	61.47	11.75	27.2	60.27	32.50	27.3	16.33	34.05	27.4	32.18	46.79
28.2	3.15	12.23	28.2	60.46	11.67	28.2	59.99	32.39	28.3	16.10	34.16	28.4	32.03	46.98
29.2	2.91	12.10	29.2	59.52	11.58	29.2	59.69	32.26	29.3	15.89	34.27	29.4	31.88	47.17
30.2	2.69	11.99	30.2	58.64	11.53	30.2	59.40	32.14	30.3	15.70	34.38	30.4	31.73	47.37
31.2	2.48	11.89	31.2	57.76	11.47	31.2	59.10	32.00	31.3	15.51	34.50	31.4	31.60	47.57
13.72	+13.68		50.70	+50.69		11.93	-11.89		12.31	+12.27		11.86	+11.82	
0 ^h 57 ^m	9 ^s .300		1 ^h 30 ^m	13 ^s .156		1 ^h 42 ^m	2 ^s .339		4 ^h 10 ^m	2 ^s .561		5 ^h 35 ^m	12 ^s .782	
+85° 48'	45'' .30		+88° 51'	43'' .55		-85° 11'	21'' .46		+85° 20'	10'' .34		+85° 9'	30'' .24	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Menes. Mag. 6.2			C Menes. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
Jan. 5 46	-84 49	"	Jan. 6 47	-80 43	"	Jan. 7 2	+87 10	"	Jan. 7 13	+82 34	"	Jan. 7 16	-86 54	"
0.5 25.81	48.31	0.5	0.5 5.15	36.15	0.5	0.5 42.13	53.42	0.5	0.5 57.32	27.41	0.5	0.5 37.37	2.82	
1.5 25.72	48.68	1.5	1.5 5.15	36.56	1.5	1.5 42.22	53.69	1.5	1.5 57.36	27.66	1.5	1.5 37.39	3.23	
2.5 25.62	49.05	2.5	2.5 5.13	36.97	2.5	2.5 42.33	53.97	2.5	2.5 57.42	27.90	2.5	2.5 37.39	3.64	
3.5 25.48	49.43	3.5	3.5 5.10	37.38	3.5	3.5 42.46	54.23	3.5	3.5 57.49	28.14	3.5	3.5 37.36	4.05	
4.5 25.35	49.78	4.5	4.5 5.06	37.78	4.5	4.5 42.59	54.51	4.5	4.5 57.56	28.38	4.5	4.5 37.30	4.45	
5.4 25.20	50.12	5.5	5.5 5.03	38.16	5.5	5.5 42.74	54.80	5.5	5.5 57.63	28.64	5.5	5.5 37.22	4.83	
6.4 25.05	50.44	6.5	6.5 4.99	38.53	6.5	6.5 42.88	55.10	6.5	6.5 57.70	28.93	6.5	6.5 37.13	5.20	
7.4 24.90	50.72	7.5	7.5 4.95	38.87	7.5	7.5 43.01	55.42	7.5	7.5 57.77	29.24	7.5	7.5 37.02	5.56	
8.4 24.75	51.00	8.5	8.5 4.91	39.20	8.5	8.5 43.12	55.76	8.5	8.5 57.83	29.56	8.5	8.5 36.91	5.90	
9.4 24.61	51.28	9.5	9.5 4.86	39.53	9.5	9.5 43.21	56.11	9.5	9.5 57.88	29.90	9.5	9.5 36.81	6.23	
10.4 24.48	51.55	10.5	10.5 4.82	39.85	10.5	10.5 43.26	56.46	10.5	10.5 57.92	30.23	10.5	10.5 36.72	6.54	
11.4 24.35	51.83	11.5	11.5 4.78	40.18	11.5	11.5 43.28	56.81	11.5	11.5 57.93	30.56	11.5	11.5 36.63	6.86	
12.4 24.21	52.11	12.5	12.5 4.74	40.51	12.5	12.5 43.29	57.15	12.5	12.5 57.94	30.89	12.5	12.5 36.55	7.20	
13.4 24.07	52.40	13.5	13.5 4.70	40.86	13.5	13.5 43.25	57.48	13.5	13.5 57.95	31.22	13.5	13.5 36.48	7.55	
14.4 23.93	52.71	14.5	14.5 4.66	41.22	14.5	14.5 43.21	57.78	14.5	14.5 57.95	31.51	14.5	14.5 36.41	7.91	
15.4 23.79	53.04	15.5	15.5 4.62	41.60	15.5	15.5 43.17	58.07	15.5	15.5 57.95	31.78	15.5	15.5 36.32	8.28	
16.4 23.62	53.37	16.5	16.5 4.57	41.98	16.5	16.5 43.14	58.34	16.5	16.5 57.95	32.05	16.5	16.5 36.21	8.67	
17.4 23.45	53.70	17.5	17.5 4.51	42.38	17.5	17.5 43.13	58.61	17.5	17.5 57.95	32.31	17.5	17.5 36.08	9.07	
18.4 23.25	54.02	18.5	18.5 4.45	42.76	18.5	18.5 43.14	58.88	18.5	18.5 57.98	32.56	18.5	18.5 35.91	9.48	
19.4 23.05	54.30	19.5	19.5 4.37	43.13	19.5	19.5 43.17	59.17	19.5	19.5 58.01	32.82	19.5	19.5 35.73	9.86	
20.4 22.82	54.58	20.4	20.4 4.29	43.47	20.5	20.5 43.21	59.47	20.5	20.5 58.04	33.10	20.5	20.5 35.50	10.23	
21.4 22.60	54.82	21.4	21.4 4.21	43.79	21.5	21.5 43.25	59.78	21.5	21.5 58.07	33.42	21.5	21.5 35.27	10.57	
22.4 22.40	55.04	22.4	22.4 4.13	44.09	22.5	22.5 43.27	60.12	22.5	22.5 58.09	33.74	22.5	22.5 35.04	10.90	
23.4 22.20	55.24	23.4	23.4 4.05	44.38	23.5	23.5 43.24	60.47	23.5	23.5 58.10	34.08	23.5	23.5 34.82	11.19	
24.4 22.01	55.45	24.4	24.4 3.97	44.66	24.4	24.4 43.18	60.81	24.5	24.5 58.10	34.42	24.5	24.5 34.62	11.48	
25.4 21.82	55.69	25.4	25.4 3.90	44.96	25.4	25.4 43.08	61.14	25.5	25.5 58.06	34.76	25.5	25.5 34.43	11.78	
26.4 21.64	55.93	26.4	26.4 3.82	45.27	26.4	26.4 42.94	61.46	26.5	26.5 58.02	35.07	26.5	26.5 34.25	12.10	
27.4 21.45	56.19	27.4	27.4 3.74	45.59	27.4	27.4 42.79	61.76	27.4	27.4 57.97	35.36	27.5	27.5 34.08	12.44	
28.4 21.26	56.46	28.4	28.4 3.67	45.93	28.4	28.4 42.63	62.05	28.4	28.4 57.93	35.63	28.4	28.4 33.91	12.80	
29.4 21.05	56.75	29.4	29.4 3.59	46.30	29.4	29.4 42.48	62.31	29.4	29.4 57.88	35.87	29.4	29.4 33.71	13.18	
30.4 20.82	57.03	30.4	30.4 3.51	46.65	30.4	30.4 42.35	62.56	30.4	30.4 57.84	36.10	30.4	30.4 33.48	13.55	
31.4 20.59	57.30	31.4	31.4 3.41	46.99	31.4	31.4 42.24	62.81	31.4	31.4 57.81	36.35	31.4	31.4 33.22	13.93	
11.10 -11.05	6.21 -6.12	20.35 +20.32	7.74 +7.67	18.50 -18.48										
5 ^h 46 ^m 14 ^s .756	6 ^h 46 ^m 58 ^s .546	7 ^h 2 ^m 4 ^s .048	7 ^h 13 ^m 42 ^s .294	7 ^h 16 ^m 20 ^s .292										
-84° 49' 46".89	-80° 43' 38".16	+87° 10' 54".74	+82° 34' 30".13	-86° 54' 6".70										

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 8 17	° ' " +88 52	Jan.	h m 9 9	° ' " -85 19	Jan.	h m 9 25	° ' " +81 41	Jan.	h m 9 36	° ' " -80 33	Jan.	h m 10 21	° ' " +82 58
0.6	16.68	50.38	0.6	6.86	47.99	0.6	32.61	24.46	0.6	26.82	56.57	0.7	14.97	32.37
1.6	17.19	50.64	1.6	7.03	48.34	1.6	32.71	24.64	1.6	26.91	56.91	1.6	15.11	32.50
2.6	17.73	50.89	2.6	7.18	48.72	2.6	32.82	24.80	2.6	27.01	57.27	2.6	15.26	32.62
3.6	18.30	51.12	3.6	7.32	49.11	3.6	32.95	24.95	3.6	27.11	57.65	3.6	15.42	32.71
4.6	18.93	51.36	4.6	7.45	49.49	4.6	33.08	25.10	4.6	27.20	58.02	4.6	15.59	32.79
5.6	19.57	51.69	5.6	7.55	49.86	5.6	33.21	25.26	5.6	27.27	58.40	5.6	15.76	32.88
6.6	20.24	51.87	6.6	7.63	50.23	6.6	33.34	25.43	6.6	27.34	58.78	6.6	15.94	33.01
7.5	20.89	52.15	7.6	7.71	50.59	7.6	33.48	25.63	7.6	27.40	59.11	7.6	16.13	33.14
8.5	21.52	52.45	8.6	7.78	50.93	8.6	33.61	25.85	8.6	27.46	59.45	8.6	16.31	33.29
9.5	22.09	52.78	9.6	7.84	51.27	9.6	33.73	26.09	9.6	27.51	59.79	9.6	16.49	33.47
10.5	22.59	53.11	10.6	7.92	51.60	10.6	33.84	26.34	10.6	27.57	60.12	10.6	16.65	33.66
11.5	23.02	53.43	11.6	8.00	51.93	11.6	33.94	26.60	11.6	27.62	60.44	11.6	16.81	33.87
12.5	23.39	53.75	12.6	8.08	52.26	12.6	34.05	26.86	12.6	27.68	60.77	12.6	16.98	34.08
13.5	23.69	54.08	13.6	8.17	52.59	13.6	34.14	27.13	13.6	27.74	61.11	13.6	17.09	34.29
14.5	23.93	54.40	14.6	8.26	52.94	14.6	34.22	27.37	14.6	27.81	61.46	14.6	17.21	34.49
15.5	24.15	54.70	15.6	8.35	53.32	15.6	34.29	27.61	15.6	27.88	61.82	15.6	17.34	34.70
16.5	24.38	54.97	16.6	8.44	53.72	16.6	34.37	27.84	16.6	27.95	62.19	16.6	17.45	34.90
17.5	24.64	55.24	17.6	8.53	54.13	17.6	34.45	28.04	17.6	28.01	62.60	17.6	17.57	35.08
18.5	24.94	55.47	18.6	8.58	54.55	18.6	34.53	28.24	18.6	28.07	63.02	18.6	17.70	35.24
19.5	25.31	55.73	19.6	8.62	54.97	19.6	34.63	28.46	19.6	28.12	63.45	19.6	17.83	35.40
20.5	25.72	56.00	20.5	8.63	55.41	20.6	34.73	28.68	20.6	28.16	63.88	20.6	17.98	35.57
21.5	26.14	56.31	21.5	8.64	55.82	21.6	34.84	28.90	21.6	28.19	64.29	21.6	18.14	35.75
22.5	26.54	56.65	22.5	8.63	56.19	22.6	34.95	29.16	22.6	28.21	64.66	22.6	18.30	35.95
23.5	26.85	56.99	23.5	8.61	56.54	23.6	35.06	29.45	23.6	28.23	65.04	23.6	18.45	36.18
24.5	27.09	57.34	24.5	8.61	56.88	24.6	35.14	29.76	24.6	28.25	65.38	24.6	18.59	36.45
25.5	27.21	57.71	25.5	8.62	57.23	25.5	35.20	30.09	25.6	28.27	65.72	25.6	18.71	36.72
26.5	27.22	58.04	26.5	8.64	57.58	26.5	35.26	30.38	26.6	28.30	66.08	26.6	18.81	37.00
27.5	27.18	58.36	27.5	8.67	57.95	27.5	35.30	30.67	27.5	28.33	66.45	27.6	18.90	37.27
28.5	27.10	58.66	28.5	8.70	58.34	28.5	35.33	30.95	28.5	28.37	66.84	28.6	18.98	37.52
29.5	27.04	58.94	29.5	8.73	58.75	29.5	35.37	31.21	29.5	28.41	67.25	29.6	19.05	37.76
30.5	27.00	59.21	30.5	8.74	59.17	30.5	35.42	31.45	30.5	28.45	67.67	30.6	19.13	37.99
31.5	27.01	59.48	31.5	8.74	59.61	31.5	35.46	31.70	31.5	28.47	68.11	31.6	19.22	38.21
51.25	+51.24		12.29	-12.25		6.92	+6.85		6.10	-6.02		8.18	+8.12	
8 ^h 15 ^m	48° 38'		9 ^h 8 ^m	57° 938		9 ^h 25 ^m	21° 719		9 ^h 36 ^m	22° 847		10 ^h 21 ^m	4° 831	
+88° 53'	0° 29'		-85° 19'	57° 45'		+81° 41'	41° 50'		-80° 34'	6° 83'		+82° 58'	54° 07'	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1872. Mag. 6.3			2 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			K Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
Jan. 10 59	58.98	-84 8	Jan. 12 14	38.79	+88 9	Jan. 12 46	6.64	-84 40	Jan. 12 48	31.72	+83 51	Jan. 13 27	11.96	-85 21
0.7	59.20	37.88	0.7	39.39	9.03	0.8	6.93	9.16	0.8	31.91	23.04	0.8	12.29	29.57
1.7	59.42	38.10	1.7	39.98	9.04	1.8	7.23	9.21	1.8	32.09	22.99	1.8	12.62	29.59
2.7	59.62	38.34	2.7	40.58	8.99	3.7	7.52	9.38	3.7	32.28	22.82	3.8	12.97	29.63
3.7	59.83	38.62	3.7	41.21	8.96	4.7	7.81	9.51	4.7	32.47	22.74	4.8	13.31	29.69
4.7	60.02	38.91	4.7	41.86	8.92	5.7	8.09	9.66	5.7	32.67	22.64	5.8	13.64	29.77
5.7	60.21	39.20	5.7	42.57	8.88	6.7	8.34	9.80	6.7	32.90	22.54	6.8	13.96	29.85
6.7	60.37	39.49	6.7	43.30	8.87	7.7	8.60	9.96	7.7	33.13	22.48	7.8	14.26	29.95
7.7	60.51	40.05	7.7	44.05	8.87	8.7	8.84	10.11	8.7	33.36	22.42	8.8	14.53	30.04
8.7	60.67	40.33	8.7	44.80	8.88	9.7	9.06	10.27	9.7	33.59	22.37	9.8	14.81	30.12
9.7	60.82	40.59	9.7	45.54	8.92	10.7	9.29	10.41	10.7	33.82	22.34	10.8	15.08	30.19
10.7	60.97	40.84	10.7	46.26	8.99	11.7	9.51	10.52	11.7	34.05	22.35	11.8	15.35	30.25
11.7	61.13	41.09	11.7	46.97	9.07	12.7	9.75	10.64	12.7	34.27	22.36	12.7	15.63	30.31
12.6	61.29	41.35	12.6	47.64	9.15	13.7	9.99	10.77	13.7	34.47	22.39	13.7	15.92	30.36
13.6	61.47	41.61	13.6	48.26	9.24	14.7	10.24	10.90	14.7	34.67	22.43	14.7	16.22	30.42
14.6	61.65	41.90	14.6	48.86	9.32	15.7	10.50	11.04	15.7	34.87	22.46	15.7	16.53	30.50
15.6	61.82	42.21	15.6	49.42	9.40	16.7	10.78	11.21	16.7	35.05	22.49	16.7	16.86	30.59
16.6	62.01	42.53	16.6	49.98	9.47	17.7	11.06	11.39	17.7	35.23	22.51	17.7	17.21	30.71
17.6	62.19	42.89	17.6	50.55	9.53	18.7	11.34	11.61	18.7	35.42	22.51	18.7	17.55	30.85
18.6	62.33	43.25	18.6	51.16	9.58	19.7	11.61	11.83	19.7	35.61	22.51	19.7	17.88	31.02
19.6	62.48	43.61	19.6	51.81	9.61	20.7	11.87	12.07	20.7	35.83	22.50	20.7	18.20	31.20
20.6	62.61	43.99	20.6	52.50	9.66	21.7	12.10	12.34	21.7	36.06	22.49	21.7	18.50	31.41
21.6	62.71	44.36	21.6	53.21	9.74	22.7	12.31	12.59	22.7	36.28	22.51	22.7	18.77	31.61
22.6	62.81	44.69	22.6	53.93	9.83	23.7	12.51	12.82	23.7	36.51	22.55	23.7	19.04	31.79
23.6	62.91	45.01	23.6	54.65	9.97	24.7	12.71	13.04	24.7	36.74	22.60	24.7	19.28	31.94
24.6	63.02	45.30	24.6	55.31	10.11	25.7	12.91	13.24	25.7	36.95	22.70	25.7	19.55	32.09
25.6	63.15	45.61	25.6	55.92	10.29	26.7	13.13	13.43	26.7	37.15	22.80	26.7	19.82	32.23
26.6	63.28	45.93	26.6	56.48	10.47	27.7	13.36	13.62	27.7	37.34	22.93	27.7	20.10	32.37
27.6	63.43	46.27	27.6	56.99	10.64	28.7	13.61	13.83	28.7	37.52	23.06	28.7	20.41	32.52
28.6	63.57	46.62	28.6	57.47	10.79	29.7	13.86	14.06	29.7	37.68	23.17	29.7	20.73	32.69
29.6	63.71	46.99	29.6	57.97	10.93	30.7	14.11	14.32	30.7	37.85	23.28	30.7	21.05	32.88
30.6	63.84	47.38	30.6	58.47	11.07	31.7	14.36	14.59	31.7	38.02	23.37	31.7	21.37	33.09
31.6	63.84	47.38	31.6	58.47	11.07	31.7	14.36	14.59	31.7	38.02	23.37	31.7	21.37	33.09
9.80	-9.75	31.02	+31.00	10.76	-10.72	9.34	+9.29	12.36	-12.32					
10 ^h 59 ^m	55 ^s .280	12 ^h 14 ^m	28 ^s .425	12 ^h 46 ^m	7 ^s .152	12 ^h 48 ^m	30 ^s .418	13 ^h 27 ^m	14 ^s .624					
-84° 8'	50'' .60	+88° 9'	36'' .08	-84° 40'	22'' .34	+83° 51'	50'' .47	-85° 21'	42'' .23					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '
	14 13	-83 17		15 3	+87 32		15 23	-84 11		16 54	+82 10		17 15	-80 46
	s	"		s	"		s	"		s	"		s	"
0.8	24.85	9.66	0.9	19.12	47.42	0.9	50.93	21.57	0.9	14.86	19.09	0.9	50.39	63.65
1.8	25.07	9.57	1.8	19.46	47.20	1.9	51.15	21.38	1.9	14.92	18.78	1.9	50.47	63.32
2.8	25.30	9.51	2.8	19.78	46.99	2.9	51.39	21.19	2.9	14.97	18.49	2.9	50.59	63.02
3.8	25.54	9.47	3.8	20.09	46.76	3.9	51.64	21.03	3.9	15.02	18.18	3.9	50.69	62.73
4.8	25.78	9.44	4.8	20.42	46.54	4.9	51.89	20.89	4.9	15.06	17.88	4.9	50.82	62.45
5.8	26.02	9.45	5.8	20.76	46.30	5.8	52.15	20.78	5.9	15.12	17.56	5.9	50.95	62.19
6.8	26.25	9.48	6.8	21.13	46.06	6.8	52.39	20.70	6.9	15.18	17.22	6.9	51.07	61.95
7.8	26.46	9.51	7.8	21.54	45.80	7.8	52.64	20.62	7.9	15.26	16.87	7.9	51.19	61.74
8.8	26.66	9.52	8.8	21.98	45.56	8.8	52.86	20.55	8.9	15.34	16.53	8.9	51.30	61.53
9.8	26.87	9.54	9.8	22.43	45.35	9.8	53.09	20.46	9.9	15.43	16.20	9.9	51.40	61.32
10.8	27.06	9.56	10.8	22.90	45.15	10.8	53.29	20.37	10.9	15.52	15.87	10.9	51.51	61.10
11.8	27.25	9.57	11.8	23.38	44.96	11.8	53.50	20.28	11.9	15.61	15.55	11.9	51.60	60.88
12.8	27.45	9.57	12.8	23.86	44.79	12.8	53.72	20.19	12.9	15.69	15.25	12.9	51.70	60.66
13.8	27.65	9.57	13.8	24.33	44.65	13.8	53.95	20.07	13.9	15.81	14.96	13.9	51.80	60.42
14.8	27.87	9.56	14.8	24.77	44.51	14.8	54.17	19.95	14.9	15.91	14.70	14.9	51.91	60.16
15.8	28.09	9.57	15.8	25.20	44.38	15.8	54.41	19.83	15.9	16.01	14.46	15.9	52.02	59.90
16.8	28.32	9.57	16.8	25.62	44.26	16.8	54.68	19.73	16.9	16.10	14.22	16.9	52.15	59.65
17.8	28.57	9.61	17.8	26.00	44.13	17.8	54.95	19.64	17.9	16.19	13.98	17.9	52.29	59.41
18.8	28.82	9.68	18.8	26.39	43.99	18.8	55.23	19.58	18.9	16.28	13.72	18.9	52.44	59.17
19.8	29.07	9.77	19.8	26.79	43.81	19.8	55.52	19.54	19.9	16.37	13.44	19.9	52.60	58.96
20.8	29.31	9.88	20.8	27.21	43.63	20.8	55.81	19.53	20.9	16.45	13.16	20.9	52.76	58.77
21.8	29.54	10.02	21.8	27.66	43.46	21.8	56.09	19.54	21.9	16.55	12.86	21.9	52.93	58.62
22.8	29.75	10.16	22.8	28.16	43.28	22.8	56.34	19.56	22.9	16.66	12.55	22.9	53.07	58.48
23.8	29.95	10.28	23.8	28.67	43.13	23.8	56.58	19.57	23.9	16.78	12.26	23.9	53.21	58.35
24.7	30.14	10.38	24.8	29.21	43.00	24.8	56.81	19.58	24.9	16.91	11.97	24.9	53.34	58.19
25.7	30.33	10.46	25.8	29.74	42.90	25.8	57.04	19.55	25.9	17.04	11.72	25.9	53.46	58.02
26.7	30.53	10.55	26.8	30.26	42.84	26.8	57.27	19.52	26.9	17.17	11.49	26.9	53.58	57.84
27.7	30.75	10.62	27.8	30.76	42.78	27.8	57.51	19.47	27.9	17.31	11.29	27.9	53.71	57.65
28.7	30.97	10.69	28.8	31.23	42.74	28.8	57.77	19.43	28.8	17.43	11.11	28.9	53.84	57.46
29.7	31.20	10.77	29.8	31.68	42.70	29.8	58.04	19.39	29.8	17.56	10.93	29.9	53.99	57.23
30.7	31.45	10.88	30.8	32.10	42.65	30.8	58.32	19.38	30.8	17.67	10.75	30.9	54.16	57.03
31.7	31.69	11.01	31.8	32.53	42.60	31.8	58.62	19.39	31.8	17.79	10.57	31.9	54.32	56.84
8.55	-8.49		23.35	+23.33		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m	27 ^s .793		15 ^h 3 ^m	41 ^s .175		15 ^h 23 ^m	56 ^s .594		16 ^h 54 ^m	25 ^s .488		17 ^h 15 ^m	54 ^s .896	
-83° 17'	21'''.03		+87° 33'	10'''.52		-84° 11'	30'''.39		+82° 10'	32'''.75		-80° 47'	6'''.56	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursa Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursa Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			78 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Jan.	17 58	+86 36	Jan.	18 5	-87 39	Jan.	19 0	+89 0	Jan.	19 26	-89 13	Jan.	20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
0.9	32.24	44.64	0.9	50.69	51.56	1.0	54.17	63.20	1.0	39.88	32.96	1.1	29.69	42.76
1.9	32.28	44.34	1.9	50.91	51.18	2.0	53.94	62.90	2.0	39.81	32.57	2.1	29.61	42.52
2.9	32.30	44.06	2.9	51.16	50.79	3.0	53.66	62.61	3.0	39.86	32.16	3.1	29.53	42.30
3.9	32.30	43.77	3.9	51.44	50.43	4.0	53.34	62.34	4.0	40.03	31.76	4.1	29.45	42.07
4.9	32.31	43.45	4.9	51.75	50.09	5.0	52.99	62.04	5.0	40.33	31.38	5.1	29.36	41.83
5.9	32.32	43.13	5.9	52.09	49.77	5.9	52.64	61.72	6.0	40.69	31.01	6.1	29.27	41.59
6.9	32.33	42.79	6.9	52.43	49.47	6.9	52.31	61.41	7.0	41.09	30.65	7.1	29.18	41.31
7.9	32.37	42.45	7.9	52.76	49.19	7.9	52.08	61.07	8.0	41.50	30.31	8.1	29.07	41.03
8.9	32.42	42.08	8.9	53.08	48.91	8.9	51.81	60.71	9.0	41.90	29.99	9.1	28.98	40.72
9.9	32.51	41.71	9.9	53.38	48.65	9.9	51.65	60.35	10.0	42.28	29.68	10.1	28.90	40.41
10.9	32.59	41.36	10.9	53.67	48.37	10.9	51.58	59.99	11.0	42.61	29.35	11.1	28.81	40.09
11.9	32.70	41.01	11.9	53.95	48.09	11.9	51.59	59.64	12.0	42.89	29.02	12.1	28.75	39.76
12.9	32.83	40.68	12.9	54.23	47.81	12.9	51.66	59.29	12.9	43.15	28.68	13.1	28.68	39.42
13.9	32.96	40.35	13.9	54.50	47.50	13.9	51.77	58.95	13.9	43.41	28.34	14.1	28.63	39.09
14.9	33.10	40.07	14.9	54.79	47.19	14.9	51.93	58.65	14.9	43.68	27.98	15.0	28.58	38.79
15.9	33.24	39.79	15.9	55.11	46.87	15.9	52.07	58.36	15.9	44.01	27.60	16.0	28.54	38.51
16.9	33.37	39.52	16.9	55.47	46.54	16.9	52.18	58.08	16.9	44.44	27.22	17.0	28.50	38.24
17.9	33.47	39.26	17.9	55.88	46.20	17.9	52.25	57.80	17.9	45.00	26.81	18.0	28.46	38.00
18.9	33.57	38.98	18.9	56.33	45.89	18.9	52.27	57.52	18.9	45.70	26.42	19.0	28.42	37.73
19.9	33.67	38.68	19.9	56.81	45.60	19.9	52.24	57.24	19.9	46.53	26.04	20.0	28.36	37.46
20.9	33.76	38.37	20.9	57.32	45.32	20.9	52.18	56.92	20.9	47.46	25.70	21.0	28.30	37.16
21.9	33.86	38.04	21.9	57.81	45.08	21.9	52.17	56.58	21.9	48.40	25.36	22.0	28.24	36.84
22.9	34.00	37.70	22.9	58.28	44.85	22.9	52.25	56.21	22.9	49.33	25.04	23.0	28.18	36.50
23.9	34.16	37.36	23.9	58.72	44.63	23.9	52.40	55.85	23.9	50.17	24.75	24.0	28.13	36.15
24.9	34.35	37.02	24.9	59.14	44.42	24.9	52.66	55.49	24.9	50.93	24.46	25.0	28.09	35.79
25.9	34.57	36.72	25.9	59.52	44.18	25.9	53.04	55.15	25.9	51.59	24.14	26.0	28.06	35.44
26.9	34.79	36.43	26.9	59.90	43.90	26.9	53.49	54.83	26.9	52.21	23.81	27.0	28.04	35.09
27.9	35.01	36.19	27.9	60.30	43.62	27.9	53.97	54.54	27.9	52.84	23.45	28.0	28.04	34.75
28.9	35.24	35.95	28.9	60.72	43.33	28.9	54.45	54.26	28.9	53.54	23.09	29.0	28.04	34.45
29.9	35.44	35.72	29.9	61.19	43.04	29.9	54.88	54.01	29.9	54.33	22.72	30.0	28.04	34.17
30.9	35.64	35.49	30.9	61.69	42.76	30.9	55.27	53.77	30.9	55.24	22.35	31.0	28.04	33.91
31.9	35.82	35.26	31.9	62.23	42.49	31.9	55.64	53.50	31.9	56.28	21.99	32.0	28.03	33.63
16.92	+16.89		24.52	-24.50		58.24	+58.23		73.87	-73.86		7.39	+7.33	
17 ^h 59 ^m	1° 30'		18 ^h 6 ^m	11° 89'		19 ^h 2 ^m	39° 62'		19 ^h 27 ^m	42° 21'		20 ^h 48 ^m	40° 49'	
+86° 36'	51° 17'		-87° 39'	51° 82'		+89° 1'	2° 17'		-89° 13'	28° 57'		+82° 13'	29° 86'	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON:

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 21 38	° ' " -83 6	Jan.	h m 22 15	° ' " -86 23	Jan.	h m 22 37	° ' " -81 49	Jan.	h m 23 27	° ' " +86 51	Jan.	h m 23 47	° ' " -82 28
	s "	"		s "	"		s "	"		s "	"		s "	"
1.1	15.83	17.67	1.1	62.64	39.06	1.2	37.43	14.78	1.2	32.94	24.28	1.2	16.63	61.91
2.1	15.72	17.36	2.1	62.36	38.78	2.2	37.30	14.53	2.2	32.61	24.23	2.2	16.46	61.78
3.1	15.61	17.03	3.1	62.09	38.46	3.2	37.18	14.27	3.2	32.29	24.19	3.2	16.29	61.62
4.1	15.52	16.69	4.1	61.86	38.15	4.2	37.08	14.00	4.2	31.95	24.15	4.2	16.14	61.44
5.1	15.45	16.36	5.1	61.64	37.83	5.2	36.97	13.72	5.2	31.59	24.11	5.2	15.98	61.23
6.1	15.39	16.02	6.1	61.44	37.52	6.1	36.87	13.44	6.2	31.22	24.06	6.2	15.84	61.03
7.1	15.33	15.70	7.1	61.26	37.22	7.1	36.79	13.17	7.2	30.83	24.01	7.2	15.71	60.82
8.1	15.28	15.40	8.1	61.10	36.93	8.1	36.72	12.91	8.2	30.42	23.94	8.2	15.58	60.63
9.1	15.23	15.11	9.1	60.94	36.65	9.1	36.64	12.65	9.2	30.01	23.85	9.2	15.46	60.44
10.1	15.17	14.82	10.1	60.77	36.37	10.1	36.56	12.41	10.2	29.60	23.73	10.2	15.33	60.25
11.1	15.11	14.53	11.1	60.60	36.10	11.1	36.48	12.17	11.2	29.20	23.60	11.2	15.21	60.08
12.1	15.05	14.24	12.1	60.43	35.83	12.1	36.39	11.93	12.2	28.82	23.45	12.2	15.09	59.93
13.1	14.97	13.95	13.1	60.24	35.55	13.1	36.30	11.69	13.2	28.45	23.28	13.2	14.94	59.76
14.1	14.90	13.64	14.1	60.03	35.26	14.1	36.19	11.42	14.2	28.12	23.11	14.2	14.79	59.58
15.1	14.82	13.33	15.1	59.82	34.95	15.1	36.09	11.16	15.2	27.79	22.96	15.2	14.64	59.40
16.1	14.74	13.00	16.1	59.61	34.64	16.1	35.99	10.87	16.2	27.51	22.81	16.2	14.48	59.19
17.1	14.68	12.63	17.1	59.40	34.31	17.1	35.88	10.56	17.2	27.22	22.67	17.2	14.33	58.96
18.1	14.62	12.26	18.1	59.22	33.94	18.1	35.79	10.24	18.2	26.93	22.57	18.2	14.19	58.70
19.1	14.59	11.87	19.1	59.07	33.56	19.1	35.73	9.90	19.1	26.63	22.46	19.2	14.05	58.42
20.1	14.57	11.47	20.1	58.95	33.19	20.1	35.66	9.53	20.1	26.31	22.33	20.2	13.92	58.14
21.1	14.56	11.09	21.1	58.86	32.80	21.1	35.61	9.16	21.1	25.98	22.21	21.2	13.83	57.85
22.1	14.57	10.73	22.1	58.78	32.42	22.1	35.58	8.82	22.1	25.61	22.08	22.2	13.73	57.55
23.1	14.57	10.39	23.1	58.73	32.09	23.1	35.54	8.48	23.1	25.23	21.91	23.2	13.63	57.26
24.1	14.57	10.05	24.1	58.65	31.77	24.1	35.50	8.17	24.1	24.86	21.72	24.1	13.55	57.02
25.1	14.56	9.73	25.1	58.56	31.45	25.1	35.45	7.89	25.1	24.51	21.49	25.1	13.45	56.78
26.1	14.53	9.42	26.1	58.43	31.13	26.1	35.39	7.60	26.1	24.19	21.26	26.1	13.32	56.54
27.1	14.49	9.09	27.1	58.31	30.81	27.1	35.31	7.31	27.1	23.90	21.02	27.1	13.20	56.30
28.0	14.45	8.73	28.1	58.16	30.46	28.1	35.23	7.00	28.1	23.65	20.79	28.1	13.07	56.04
29.0	14.41	8.37	29.1	58.01	30.10	29.1	35.15	6.67	29.1	23.41	20.57	29.1	12.93	55.77
30.0	14.38	7.99	30.1	57.87	29.73	30.1	35.08	6.30	30.1	23.19	20.36	30.1	12.81	55.46
31.0	14.37	7.57	31.1	57.77	29.33	31.1	35.03	5.94	31.1	22.96	20.17	31.1	12.68	55.15
32.0	14.37	7.15	32.1	57.70	28.93	32.1	34.98	5.55	32.1	22.72	19.98	32.1	12.58	54.81
8.33	-8.27		15.89	-15.86		7.03	-6.96		18.24	+18.21		7.64	-7.58	
21 ^h 38 ^m	19 ^s .542		22 ^h 16 ^m	8 ^s .656		22 ^h 37 ^m	39 ^s .016		23 ^h 27 ^m	44 ^s .125		23 ^h 47 ^m	16 ^s .424	
-83° 6'	6'' .99		-86° 23'	27'' .13		-81° 49'	2'' .34		+86° 50'	58'' .89		-82° 28'	48'' .42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m s	° '	Feb.	h m s	° '	Feb.	h m s	° '	Feb.	h m s	° '	Feb.	h m s	° '
	0 56	+85 49		1 29	+88 52		1 41	-85 11		4 10	+85 20		5 35	+85 9
0.2	62.48	11.89	0.2	57.76	11.47	0.2	59.10	32.00	0.3	15.51	34.50	0.4	31.60	47.57
1.2	62.24	11.79	1.2	56.84	11.41	1.2	58.81	31.81	1.3	15.32	34.64	1.4	31.47	47.79
2.2	62.00	11.69	2.2	55.88	11.36	2.2	58.54	31.61	2.3	15.12	34.78	2.4	31.34	48.02
3.2	61.75	11.59	3.2	54.86	11.31	3.2	58.29	31.41	3.3	14.93	34.91	3.4	31.21	48.26
4.2	61.47	11.46	4.2	53.79	11.24	4.2	58.04	31.21	4.3	14.70	35.05	4.4	31.05	48.50
5.2	61.20	11.34	5.2	52.68	11.18	5.2	57.81	31.00	5.3	14.46	35.20	5.4	30.88	48.74
6.2	60.91	11.20	6.2	51.56	11.09	6.2	57.58	30.80	6.3	14.20	35.35	6.4	30.70	48.99
7.2	60.63	11.04	7.2	50.43	10.97	7.2	57.36	30.61	7.3	13.93	35.49	7.3	30.50	49.22
8.2	60.35	10.86	8.2	49.32	10.84	8.2	57.12	30.43	8.3	13.67	35.58	8.3	30.29	49.42
9.2	60.09	10.66	9.2	48.24	10.67	9.2	56.89	30.25	9.3	13.39	35.66	9.3	30.07	49.62
10.1	59.85	10.44	10.2	47.23	10.50	10.2	56.66	30.09	10.3	13.12	35.72	10.3	29.84	49.77
11.1	59.61	10.22	11.2	46.28	10.32	11.2	56.41	29.92	11.3	12.85	35.76	11.3	29.62	49.93
12.1	59.40	10.01	12.2	45.41	10.15	12.2	56.14	29.74	12.3	12.60	35.77	12.3	29.40	50.08
13.1	59.20	9.82	13.2	44.59	9.97	13.2	55.87	29.55	13.3	12.37	35.79	13.3	29.20	50.22
14.1	59.03	9.62	14.2	43.80	9.82	14.2	55.60	29.31	14.3	12.15	35.81	14.3	29.01	50.33
15.1	58.85	9.44	15.2	43.04	9.69	15.2	55.33	29.09	15.3	11.95	35.85	15.3	28.83	50.46
16.1	58.66	9.28	16.2	42.23	9.56	16.2	55.09	28.82	16.3	11.74	35.90	16.3	28.69	50.61
17.1	58.47	9.13	17.2	41.38	9.45	17.2	54.84	28.53	17.3	11.54	35.98	17.3	28.51	50.78
18.1	58.24	8.97	18.2	40.48	9.33	18.2	54.63	28.22	18.3	11.31	36.07	18.3	28.34	50.95
19.1	58.00	8.79	19.1	39.50	9.19	19.2	54.44	27.91	19.3	11.07	36.15	19.3	28.15	51.14
20.1	57.76	8.57	20.1	38.49	9.03	20.2	54.24	27.63	20.3	10.80	36.22	20.3	27.92	51.32
21.1	57.52	8.34	21.1	37.49	8.85	21.2	54.06	27.38	21.3	10.52	36.27	21.3	27.68	51.47
22.1	57.29	8.07	22.1	36.53	8.61	22.1	53.86	27.14	22.3	10.22	36.28	22.3	27.43	51.61
23.1	57.09	7.79	23.1	35.66	8.38	23.1	53.64	26.91	23.2	9.94	36.25	23.3	27.17	51.71
24.1	56.91	7.51	24.1	34.88	8.13	24.1	53.42	26.68	24.2	9.67	36.19	24.3	26.92	51.79
25.1	56.77	7.24	25.1	34.19	7.89	25.1	53.19	26.44	25.2	9.42	36.13	25.3	26.68	51.84
26.1	56.63	7.00	26.1	33.56	7.64	26.1	52.95	26.17	26.2	9.18	36.08	26.3	26.45	51.89
27.1	56.50	6.75	27.1	32.94	7.44	27.1	52.71	25.91	27.2	8.96	36.04	27.3	26.24	51.94
28.1	56.37	6.52	28.1	32.33	7.24	28.1	52.48	25.59	28.2	8.74	36.00	28.3	26.04	52.00
29.1	56.24	6.29	29.1	31.69	7.02	29.1	52.27	25.26	29.2	8.53	35.98	29.3	25.83	52.08
30.1	56.09	6.05	30.1	31.00	6.82	30.1	52.07	24.93	30.2	8.30	35.95	30.3	25.63	52.16
31.1	55.92	5.80	31.1	30.27	6.61	31.1	51.88	24.60	31.2	8.07	35.94	31.3	25.40	52.26
13.72	+13.68		50.68	+50.67		11.93	-11.89		12.32	+12.28		11.86	+11.82	
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			C Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "
	5 46	-84 49		6 46	-80 43		7 2	+87 11		7 13	+82 34		7 16	-86 54
	s	"		s	"		s	"		s	"		s	"
0.4	20.59	57.30	0.4	63.41	46.99	0.4	42.24	2.81	0.4	57.81	36.35	0.4	33.22	13.92
1.4	20.34	57.54	1.4	63.32	47.32	1.4	42.15	3.08	1.4	57.78	36.62	1.4	32.95	14.22
2.4	20.10	57.75	2.4	63.22	47.63	2.4	42.04	3.36	2.4	57.77	36.90	2.4	32.67	14.61
3.4	19.85	57.95	3.4	63.11	47.92	3.4	41.94	3.65	3.4	57.74	37.18	3.4	32.37	14.92
4.4	19.60	58.13	4.4	63.01	48.18	4.4	41.82	3.96	4.4	57.71	37.49	4.4	32.07	15.21
5.4	19.37	58.30	5.4	62.90	48.43	5.4	41.67	4.28	5.4	57.67	37.80	5.4	31.78	15.49
6.4	19.13	58.47	6.4	62.80	48.67	6.4	41.49	4.61	6.4	57.62	38.12	6.4	31.49	15.77
7.4	18.91	58.64	7.4	62.69	48.92	7.4	41.29	4.92	7.4	57.55	38.43	7.4	31.21	16.04
8.4	18.68	58.80	8.4	62.59	49.17	8.4	41.06	5.23	8.4	57.47	38.72	8.4	30.94	16.32
9.4	18.47	58.98	9.4	62.49	49.43	9.4	40.80	5.52	9.4	57.38	39.01	9.4	30.68	16.61
10.3	18.24	59.16	10.4	62.39	49.70	10.4	40.53	5.79	10.4	57.29	39.28	10.4	30.42	16.90
11.3	18.01	59.37	11.4	62.28	49.97	11.4	40.25	6.03	11.4	57.20	39.53	11.4	30.16	17.21
12.3	17.77	59.58	12.4	62.18	50.27	12.4	39.98	6.26	12.4	57.10	39.76	12.4	29.89	17.54
13.3	17.52	59.79	13.4	62.07	50.57	13.4	39.73	6.48	13.4	57.02	39.99	13.4	29.58	17.86
14.3	17.25	60.00	14.4	61.95	50.87	14.4	39.50	6.69	14.4	56.94	40.20	14.4	29.26	18.19
15.3	16.97	60.19	15.4	61.83	51.16	15.4	39.30	6.90	15.4	56.87	40.41	15.4	28.90	18.51
16.3	16.69	60.34	16.4	61.70	51.41	16.4	39.10	7.12	16.4	56.81	40.64	16.4	28.53	18.80
17.3	16.40	60.49	17.4	61.56	51.64	17.4	38.91	7.36	17.4	56.75	40.88	17.4	28.13	19.09
18.3	16.11	60.60	18.4	61.42	51.85	18.4	38.71	7.62	18.4	56.70	41.14	18.4	27.73	19.33
19.3	15.83	60.69	19.4	61.29	52.05	19.4	38.49	7.89	19.4	56.62	41.40	19.4	27.34	19.56
20.3	15.56	60.77	20.4	61.16	52.24	20.4	38.22	8.17	20.4	56.54	41.69	20.4	26.97	19.76
21.3	15.31	60.86	21.4	61.03	52.42	21.4	37.92	8.44	21.4	56.43	41.97	21.4	26.62	19.98
22.3	15.06	60.96	22.4	60.90	52.61	22.4	37.58	8.68	22.4	56.30	42.22	22.4	26.28	20.22
23.3	14.81	61.09	23.4	60.78	52.81	23.4	37.22	8.89	23.4	56.18	42.44	23.4	25.95	20.47
24.3	14.55	61.22	24.4	60.66	53.04	24.4	36.85	9.09	24.4	56.04	42.64	24.4	25.61	20.73
25.3	14.28	61.36	25.4	60.53	53.29	25.4	36.50	9.27	25.4	55.91	42.83	25.4	25.26	21.00
26.3	14.01	61.51	26.3	60.41	53.54	26.4	36.17	9.42	26.4	55.80	42.98	26.4	24.90	21.29
27.3	13.72	61.65	27.3	60.27	53.79	27.4	35.85	9.57	27.4	55.70	43.13	27.4	24.52	21.56
28.3	13.43	61.76	28.3	60.13	54.00	28.4	35.56	9.73	28.4	55.60	43.28	28.4	24.11	21.82
29.3	13.14	61.87	29.3	59.98	54.20	29.4	35.27	9.90	29.4	55.49	43.45	29.4	23.68	22.06
30.3	12.84	61.93	30.3	59.83	54.39	30.3	34.98	10.08	30.4	55.40	43.64	30.4	23.24	22.30
31.3	12.54	61.99	31.3	59.69	54.54	31.3	34.67	10.26	31.4	55.29	43.84	31.4	22.81	22.49
11.10	-11.06		6.21	-6.13		20.36	+20.34		7.74	+7.68		18.52	-18.49	
5 ^h 46 ^m	14°.756		6 ^h 46 ^m	58°.546		7 ^h 2 ^m	4°.048		7 ^h 13 ^m	42°.294		7 ^h 16 ^m	20°.292	
-84° 49'	46''.89		-80° 43'	38''.16		+87° 10'	54''.74		+82° 34'	30''.13		-86° 54'	6''.70	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Broombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "	Feb.	h m	° ' "
	8 17	+88 52		9 9	-85 19		9 25	+81 41		9 36	-80 34		10 21	+82 58
0.5	27.01	59.48	0.5	8.74	59.61	0.5	35.46	31.70	0.5	28.47	8.11	0.6	19.22	38.21
1.5	27.05	59.75	1.5	8.72	60.04	1.5	35.51	31.94	1.5	28.48	8.55	1.6	19.32	38.43
2.5	27.11	60.06	2.5	8.69	60.45	2.5	35.57	32.21	2.5	28.49	8.98	2.6	19.42	38.66
3.5	27.16	60.37	3.5	8.64	60.85	3.5	35.64	32.49	3.5	28.49	9.39	3.6	19.53	38.91
4.5	27.19	60.70	4.5	8.58	61.22	4.5	35.69	32.79	4.5	28.49	9.77	4.6	19.63	39.17
5.5	27.18	61.03	5.5	8.52	61.58	5.5	35.74	33.10	5.5	28.49	10.16	5.6	19.73	39.44
6.5	27.10	61.40	6.5	8.46	61.94	6.5	35.79	33.41	6.5	28.48	10.52	6.6	19.83	39.75
7.5	26.94	61.74	7.5	8.40	62.29	7.5	35.82	33.74	7.5	28.47	10.88	7.5	19.92	40.06
8.5	26.71	62.08	8.5	8.35	62.64	8.5	35.84	34.08	8.5	28.46	11.23	8.5	19.98	40.38
9.5	26.42	62.42	9.5	8.30	63.00	9.5	35.85	34.41	9.5	28.45	11.60	9.5	20.03	40.70
10.5	26.07	62.74	10.5	8.26	63.36	10.5	35.85	34.73	10.5	28.46	11.96	10.5	20.08	41.02
11.5	25.70	63.04	11.5	8.23	63.74	11.5	35.84	35.05	11.5	28.46	12.34	11.5	20.12	41.32
12.4	25.30	63.33	12.5	8.19	64.11	12.5	35.83	35.34	12.5	28.46	12.75	12.5	20.15	41.61
13.4	24.92	63.60	13.5	8.15	64.53	13.5	35.82	35.62	13.5	28.46	13.15	13.5	20.18	41.89
14.4	24.59	63.85	14.5	8.09	64.94	14.5	35.82	35.88	14.5	28.45	13.58	14.5	20.21	42.16
15.4	24.31	64.11	15.5	8.00	65.37	15.5	35.84	36.14	15.5	28.44	14.02	15.5	20.26	42.41
16.4	24.09	64.38	16.5	7.90	65.79	16.5	35.86	36.40	16.5	28.41	14.46	16.5	20.31	42.65
17.4	23.90	64.65	17.5	7.78	66.19	17.5	35.89	36.67	17.5	28.38	14.88	17.5	20.38	42.91
18.4	23.68	64.96	18.5	7.64	66.57	18.5	35.91	36.94	18.5	28.34	15.27	18.5	20.45	43.20
19.4	23.43	65.27	19.5	7.50	66.93	19.5	35.92	37.26	19.5	28.30	15.64	19.5	20.51	43.50
20.4	23.09	65.58	20.5	7.37	67.26	20.5	35.93	37.59	20.5	28.25	16.00	20.5	20.56	43.82
21.4	22.66	65.90	21.5	7.25	67.59	21.5	35.93	37.93	21.5	28.21	16.35	21.5	20.60	44.15
22.4	22.12	66.23	22.5	7.15	67.92	22.5	35.90	38.26	22.5	28.16	16.71	22.5	20.60	44.49
23.4	21.51	66.52	23.5	7.05	68.27	23.5	35.86	38.59	23.5	28.13	17.07	23.5	20.61	44.83
24.4	20.84	66.78	24.5	6.95	68.63	24.5	35.82	38.89	24.5	28.11	17.45	24.5	20.60	45.15
25.4	20.18	67.02	25.5	6.85	69.01	25.5	35.77	39.17	25.5	28.08	17.84	25.5	20.58	45.45
26.4	19.55	67.26	26.4	6.75	69.40	26.5	35.72	39.43	26.5	28.05	18.25	26.5	20.57	45.73
27.4	18.97	67.48	27.4	6.63	69.81	27.5	35.68	39.68	27.5	28.02	18.67	27.5	20.55	46.02
28.4	18.41	67.70	28.4	6.50	70.20	28.5	35.65	39.94	28.5	27.98	19.08	28.5	20.55	46.29
29.4	17.89	67.94	29.4	6.35	70.58	29.5	35.62	40.19	29.5	27.94	19.48	29.5	20.55	46.56
30.4	17.38	68.21	30.4	6.18	70.95	30.5	35.60	40.47	30.5	27.88	19.86	30.5	20.57	46.84
31.4	16.87	68.46	31.4	6.01	71.29	31.4	35.58	40.75	31.5	27.82	20.24	31.5	20.58	47.15
51.37	+51.36	12.30	-12.25	6.92	+6.85	6.10	-6.02	8.18	+8.12					
8 ^h 15 ^m	48°.380	9 ^h 8 ^m	57°.938	9 ^h 25 ^m	21°.719	9 ^h 36 ^m	22°.347	10 ^h 21 ^m	4°.831					
+88° 53'	0''.29	-85° 19'	57''.45	+81° 41'	41''.50	-80° 34'	6''.83	+82° 58'	54''.07					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

γ Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m s	° ' "	Feb.	h m s	° ' "	Feb.	h m s	° ' "	Feb.	h m s	° ' "	Feb.	h m s	° ' "
11 0	84 8		12 14	+88 9		12 46	-84 40		12 48	+83 51		13 27	-85 21	
0.6	3.84	47.38	0.6	58.47	11.07	0.7	14.36	14.59	0.7	38.02	23.37	0.7	21.37	33.09
1.6	3.95	47.78	1.6	59.01	11.22	1.7	14.61	14.87	1.7	38.20	23.46	1.7	21.68	33.33
2.6	4.05	48.17	2.6	59.57	11.36	2.7	14.84	15.17	2.7	38.38	23.55	2.7	21.97	33.57
3.6	4.14	48.56	3.6	60.16	11.49	3.7	15.03	15.47	3.7	38.58	23.64	3.7	22.24	33.80
4.6	4.22	48.95	4.6	60.76	11.66	4.7	15.22	15.76	4.7	38.79	23.75	4.7	22.49	34.04
5.6	4.28	49.32	5.6	61.37	11.85	5.7	15.40	16.06	5.7	38.99	23.88	5.7	22.73	34.28
6.6	4.34	49.68	6.6	61.96	12.05	6.7	15.59	16.34	6.7	39.20	24.03	6.7	22.97	34.53
7.6	4.40	50.03	7.6	62.54	12.26	7.7	15.76	16.62	7.7	39.40	24.19	7.7	23.21	34.73
8.6	4.49	50.36	8.6	63.09	12.49	8.6	15.93	16.87	8.6	39.58	24.37	8.7	23.44	34.93
9.6	4.56	50.70	9.6	63.59	12.73	9.6	16.11	17.12	9.6	39.75	24.57	9.7	23.67	35.14
10.6	4.64	51.05	10.6	64.06	12.98	10.6	16.29	17.37	10.6	39.91	24.78	10.7	23.92	35.35
11.6	4.72	51.41	11.6	64.48	13.24	11.6	16.49	17.64	11.6	40.06	25.00	11.7	24.19	35.55
12.6	4.81	51.78	12.6	64.87	13.49	12.6	16.70	17.93	12.6	40.21	25.22	12.7	24.46	35.78
13.6	4.91	52.16	13.6	65.24	13.72	13.6	16.92	18.23	13.6	40.34	25.42	13.7	24.75	36.02
14.6	5.00	52.58	14.6	65.60	13.93	14.6	17.14	18.55	14.6	40.48	25.60	14.7	25.04	36.30
15.6	5.06	53.01	15.6	65.98	14.14	15.6	17.34	18.89	15.6	40.62	25.77	15.7	25.32	36.59
16.6	5.12	53.44	16.6	66.40	14.34	16.6	17.54	19.26	16.6	40.78	25.92	16.7	25.59	36.91
17.5	5.16	53.89	17.6	66.86	14.54	17.6	17.72	19.63	17.6	40.94	26.07	17.7	25.84	37.24
18.5	5.17	54.31	18.6	67.34	14.73	18.6	17.87	20.00	18.6	41.11	26.24	18.6	26.06	37.56
19.5	5.19	54.70	19.6	67.84	14.96	19.6	18.01	20.35	19.6	41.29	26.42	19.6	26.26	37.87
20.5	5.20	55.08	20.6	68.33	15.20	20.6	18.14	20.69	20.6	41.47	26.61	20.6	26.45	38.18
21.5	5.22	55.44	21.6	68.77	15.48	21.6	18.26	21.02	21.6	41.62	26.84	21.6	26.64	38.46
22.5	5.25	55.80	22.6	69.16	15.77	22.6	18.40	21.32	22.6	41.77	27.11	22.6	26.85	38.72
23.5	5.28	56.17	23.6	69.49	16.07	23.6	18.54	21.63	23.6	41.90	27.38	23.6	27.06	38.97
24.5	5.33	56.53	24.6	69.77	16.37	24.6	18.72	21.93	24.6	42.00	27.66	24.6	27.29	39.24
25.5	5.37	56.92	25.6	70.00	16.66	25.6	18.90	22.24	25.6	42.10	27.93	25.6	27.54	39.52
26.5	5.42	57.31	26.6	70.22	16.94	26.6	19.07	22.58	26.6	42.19	28.17	26.6	27.79	39.82
27.5	5.46	57.75	27.6	70.44	17.18	27.6	19.24	22.95	27.6	42.29	28.40	27.6	28.04	40.14
28.5	5.49	58.18	28.6	70.68	17.45	28.6	19.40	23.32	28.6	42.40	28.62	28.6	28.27	40.47
29.5	5.50	58.61	29.6	70.96	17.71	29.6	19.55	23.70	29.6	42.51	28.84	29.6	28.50	40.79
30.5	5.49	59.04	30.6	71.27	17.97	30.6	19.69	24.09	30.6	42.64	29.07	30.6	28.70	41.16
31.5	5.48	59.46	31.6	71.58	18.23	31.6	19.79	24.49	31.6	42.77	29.31	31.6	28.88	41.50
9.81	-9.76		31.04	+31.02		10.77	-10.72		9.35	+9.29		12.36	-12.32	
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb. 14 13	h m	° ' -83 17	Feb. 15 8	h m	° ' +87 32	Feb. 15 23	h m	° ' -84 11	Feb. 16 54	h m	° ' +82 10	Feb. 17 15	h m	° ' -80 46
	s	"		s	"		s	"		s	"		s	"
0.7	31.69	11.01	0.8	32.53	42.60	0.8	58.62	19.39	0.8	17.79	10.57	0.9	54.32	56.84
1.7	31.93	11.18	1.8	32.98	42.52	1.8	58.91	19.42	1.8	17.90	10.37	1.9	54.49	56.69
2.7	32.15	11.36	2.8	33.45	42.45	2.8	59.19	19.48	2.8	18.03	10.14	2.8	54.66	56.56
3.7	32.37	11.54	3.8	33.95	42.37	3.8	59.46	19.54	3.8	18.16	9.93	3.8	54.83	56.44
4.7	32.57	11.72	4.8	34.47	42.29	4.8	59.71	19.60	4.8	18.30	9.71	4.8	54.99	56.34
5.7	32.76	11.90	5.8	35.01	42.23	5.8	59.96	19.68	5.8	18.44	9.50	5.8	55.14	56.25
6.7	32.95	12.07	6.7	35.56	42.18	6.8	60.20	19.76	6.8	18.59	9.29	6.8	55.29	56.15
7.7	33.13	12.25	7.7	36.11	42.15	7.8	60.43	19.81	7.8	18.74	9.09	7.8	55.42	56.06
8.7	33.32	12.39	8.7	36.66	42.14	8.8	60.67	19.87	8.8	18.91	8.91	8.8	55.56	55.96
9.7	33.51	12.53	9.7	37.21	42.17	9.8	60.90	19.91	9.8	19.06	8.77	9.8	55.70	55.82
10.7	33.69	12.68	10.7	37.73	42.20	10.8	61.14	19.95	10.8	19.21	8.63	10.8	55.84	55.69
11.7	33.91	12.83	11.7	38.22	42.25	11.7	61.40	19.98	11.8	19.37	8.53	11.8	55.98	55.55
12.7	34.13	13.00	12.7	38.69	42.31	12.7	61.66	20.01	12.8	19.52	8.43	12.8	56.15	55.42
13.7	34.35	13.17	13.7	39.15	42.36	13.7	61.93	20.07	13.8	19.66	8.32	13.8	56.32	55.28
14.7	34.57	13.36	14.7	39.58	42.41	14.7	62.22	20.15	14.8	19.80	8.23	14.8	56.49	55.15
15.7	34.80	13.60	15.7	40.00	42.43	15.7	62.51	20.23	15.8	19.94	8.13	15.8	56.68	55.06
16.7	35.02	13.86	16.7	40.46	42.43	16.7	62.80	20.37	16.8	20.07	8.00	16.8	56.87	54.99
17.7	35.22	14.12	17.7	40.92	42.43	17.7	63.08	20.53	17.8	20.22	7.87	17.8	57.06	54.93
18.7	35.42	14.38	18.7	41.43	42.43	18.7	63.35	20.70	18.8	20.36	7.72	18.8	57.25	54.90
19.7	35.60	14.64	19.7	41.95	42.43	19.7	63.59	20.86	19.8	20.53	7.56	19.8	57.42	54.89
20.7	35.77	14.88	20.7	42.49	42.47	20.7	63.83	21.01	20.8	20.69	7.42	20.8	57.58	54.86
21.7	35.93	15.12	21.7	43.04	42.54	21.7	64.05	21.14	21.8	20.86	7.32	21.8	57.73	54.83
22.7	36.09	15.32	22.7	43.56	42.64	22.7	64.27	21.26	22.8	21.04	7.25	22.8	57.88	54.78
23.7	36.27	15.52	23.7	44.06	42.77	23.7	64.51	21.37	23.8	21.20	7.20	23.8	58.02	54.71
24.7	36.46	15.72	24.7	44.53	42.90	24.7	64.75	21.47	24.8	21.36	7.16	24.8	58.17	54.62
25.7	36.65	15.94	25.7	44.96	43.03	25.7	65.01	21.55	25.8	21.51	7.16	25.8	58.34	54.54
26.7	36.86	16.16	26.7	45.38	43.16	26.7	65.28	21.67	26.8	21.66	7.16	26.8	58.52	54.45
27.7	37.06	16.41	27.7	45.78	43.28	27.7	65.55	21.80	27.8	21.81	7.12	27.8	58.71	54.40
28.7	37.27	16.69	28.7	46.19	43.38	28.7	65.83	21.97	28.8	21.96	7.09	28.8	58.90	54.37
29.6	37.46	16.98	29.7	46.60	43.48	29.7	66.10	22.16	29.8	22.11	7.06	29.8	59.08	54.36
30.6	37.64	17.29	30.7	47.05	43.58	30.7	66.36	22.35	30.8	22.27	7.02	30.8	59.27	54.37
31.6	37.81	17.59	31.7	47.51	43.69	31.7	66.60	22.56	31.8	22.44	6.97	31.8	59.45	54.38
8.55	-8.50		23.35	+23.32		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m	27°.793		15 ^h 3 ^m	41°.175		15 ^h 23 ^m	56°.594		16 ^h 54 ^m	25°.488		17 ^h 15 ^m	54°.896	
-83° 17'	21''.03		+87° 33'	10''.52		-84° 11'	30''.39		+82° 10'	32''.75		-80° 47'	6''.56	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Feb.	17 58	+86 36	Feb.	18 6	-87 39	Feb.	19 0	+89 0	Feb.	19 26	-89 13	Feb.	20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
0.9	35.82	35.26	0.9	2.23	42.49	0.9	55.64	53.50	0.9	56.28	21.99	1.0	28.03	33.63
1.9	36.01	35.01	1.9	2.79	42.25	1.9	55.97	53.22	1.9	57.39	21.64	1.9	28.02	33.31
2.9	36.20	34.74	2.9	3.35	42.03	2.9	56.32	52.93	2.9	58.56	21.30	2.9	28.00	32.99
3.9	36.42	34.46	3.9	3.90	41.83	3.9	56.71	52.61	3.9	59.74	20.98	3.9	27.99	32.66
4.9	36.64	34.18	4.9	4.42	41.63	4.9	57.14	52.28	4.9	60.91	20.70	4.9	27.98	32.32
5.9	36.88	33.91	5.9	4.95	41.44	5.9	57.63	51.95	5.9	62.05	20.42	5.9	27.97	31.98
6.9	37.15	33.64	6.9	5.46	41.27	6.9	58.21	51.63	6.9	63.14	20.14	6.9	27.97	31.61
7.9	37.42	33.39	7.9	5.94	41.09	7.9	58.85	51.33	7.9	64.19	19.86	7.9	27.98	31.25
8.9	37.72	33.14	8.9	6.42	40.90	8.9	59.57	51.03	8.9	65.20	19.58	8.9	28.00	30.89
9.9	38.02	32.91	9.9	6.89	40.71	9.9	60.34	50.75	9.9	66.18	19.30	9.9	28.03	30.54
10.9	38.32	32.71	10.9	7.37	40.48	10.9	61.15	50.48	10.9	67.17	18.99	10.9	28.07	30.20
11.9	38.62	32.52	11.9	7.87	40.26	11.9	61.95	50.24	11.9	68.19	18.67	11.9	28.11	29.87
12.9	38.92	32.34	12.9	8.40	40.04	12.9	62.74	50.00	12.9	69.28	18.34	12.9	28.15	29.58
13.8	39.20	32.19	13.9	8.97	39.82	13.9	63.47	49.79	13.9	70.48	18.00	13.9	28.20	29.29
14.8	39.47	32.05	14.9	9.58	39.59	14.9	64.16	49.58	14.9	71.81	17.67	14.9	28.23	29.02
15.8	39.72	31.86	15.8	10.23	39.39	15.9	64.78	49.35	15.9	73.26	17.35	15.9	28.27	28.75
16.8	39.96	31.68	16.8	10.88	39.21	16.9	65.38	49.11	16.9	74.82	17.07	16.9	28.30	28.47
17.8	40.22	31.48	17.8	11.55	39.07	17.9	65.97	48.86	17.9	76.42	16.79	17.9	28.33	28.15
18.8	40.49	31.25	18.8	12.21	38.94	18.9	66.62	48.59	18.9	78.01	16.54	18.9	28.35	27.84
19.8	40.79	31.02	19.8	12.82	38.84	19.9	67.35	48.32	19.9	79.53	16.31	19.9	28.38	27.50
20.8	41.11	30.82	20.8	13.40	38.73	20.9	68.19	48.04	20.9	80.97	16.09	20.9	28.42	27.15
21.8	41.45	30.62	21.8	13.96	38.60	21.9	69.13	47.79	21.9	82.30	15.86	21.9	28.47	26.80
22.8	41.81	30.47	22.8	14.48	38.47	22.9	70.14	47.54	22.9	83.57	15.61	22.9	28.52	26.46
23.8	42.17	30.33	23.8	15.03	38.33	23.9	71.17	47.33	23.9	84.82	15.34	23.9	28.60	26.16
24.8	42.51	30.23	24.8	15.58	38.15	24.9	72.22	47.14	24.9	86.10	15.07	24.9	28.69	25.88
25.8	42.86	30.14	25.8	16.18	37.97	25.9	73.24	46.97	25.9	87.45	14.77	25.9	28.77	25.61
26.8	43.18	30.05	26.8	16.80	37.80	26.9	74.20	46.81	26.9	88.91	14.48	26.9	28.85	25.37
27.8	43.49	29.96	27.8	17.46	37.65	27.9	75.11	46.64	27.9	90.49	14.20	27.9	28.93	25.13
28.8	43.80	29.86	28.8	18.14	37.50	28.9	76.00	46.48	28.9	92.15	13.92	28.9	29.01	24.88
29.8	44.11	29.76	29.8	18.83	37.39	29.8	76.87	46.31	29.9	93.86	13.68	29.9	29.07	24.61
30.8	44.42	29.62	30.8	19.50	37.31	30.8	77.75	46.12	30.9	95.59	13.46	30.9	29.14	24.34
31.8	44.74	29.49	31.8	20.16	37.25	31.8	78.67	45.92	31.9	97.30	13.26	31.9	29.21	24.05
16.91	+16.88		24.50	-24.48		58.10	+58.09		73.60	-73.59		7.39	+7.32	
17 ^h 59 ^m 1 ^s .307			18 ^h 6 ^m 11 ^s .893			19 ^h 2 ^m 39 ^s .624			19 ^h 27 ^m 42 ^s .218			20 ^h 48 ^m 40 ^s .494		
+86° 36' 51".17			-87° 39' 51".82			+89° 1' 2".17			-89° 13' 28".57			+82° 13' 29".86		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.	Wash. Mean Time.	Right Ascen- sion.	Declin- ation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Feb. 21 38	-83 5		Feb. 22 15	-86 23		Feb. 22 37	-81 48		Feb. 23 27	+86 51		Feb. 23 47	-82 28	
1.0	14.37	67.15	1.1	57.70	28.93	1.1	34.98	65.55	1.1	22.72	19.98	1.1	12.58	54.81
2.0	14.38	66.76	2.1	57.64	28.52	2.1	34.94	65.17	2.1	22.46	19.78	2.1	12.48	54.48
3.0	14.41	66.37	3.1	57.60	28.14	3.1	34.92	64.78	3.1	22.19	19.59	3.1	12.39	54.16
4.0	14.44	66.00	4.1	57.58	27.76	4.1	34.90	64.42	4.1	21.91	19.36	4.1	12.31	53.84
5.0	14.47	65.64	5.1	57.57	27.38	5.1	34.88	64.05	5.1	21.62	19.12	5.1	12.24	53.52
6.0	14.50	65.30	6.0	57.56	27.02	6.1	34.87	63.73	6.1	21.33	18.88	6.1	12.17	53.21
7.0	14.53	64.96	7.0	57.53	26.68	7.1	34.84	63.40	7.1	21.05	18.60	7.1	12.09	52.92
8.0	14.54	64.63	8.0	57.50	26.34	8.1	34.81	63.08	8.1	20.78	18.33	8.1	12.01	52.63
9.0	14.55	64.31	9.0	57.47	26.01	9.1	34.79	62.76	9.1	20.55	18.04	9.1	11.94	52.34
10.0	14.56	63.97	10.0	57.42	25.67	10.1	34.75	62.44	10.1	20.34	17.73	10.1	11.84	52.04
11.0	14.57	63.63	11.0	57.36	25.31	11.1	34.71	62.09	11.1	20.15	17.41	11.1	11.74	51.75
12.0	14.57	63.26	12.0	57.30	24.93	12.0	34.67	61.73	12.1	19.98	17.13	12.1	11.65	51.43
13.0	14.58	62.86	13.0	57.24	24.53	13.0	34.62	61.36	13.1	19.84	16.86	13.1	11.55	51.12
14.0	14.61	62.46	14.0	57.20	24.12	14.0	34.61	60.96	14.1	19.70	16.61	14.1	11.46	50.76
14.9	14.64	62.04	15.0	57.19	23.70	15.0	34.59	60.55	15.1	19.57	16.36	15.1	11.37	50.38
15.9	14.69	61.63	16.0	57.20	23.27	16.0	34.58	60.14	16.1	19.40	16.12	16.1	11.31	49.99
16.9	14.77	61.22	17.0	57.26	22.84	17.0	34.59	59.72	17.1	19.23	15.89	17.1	11.25	49.59
17.9	14.85	60.81	18.0	57.35	22.42	18.0	34.62	59.30	18.1	19.04	15.66	18.1	11.20	49.20
18.9	14.94	60.44	19.0	57.43	22.05	19.0	34.65	58.93	19.1	18.81	15.39	19.1	11.17	48.83
19.9	15.03	60.09	20.0	57.52	21.66	20.0	34.67	58.54	20.1	18.61	15.11	20.1	11.14	48.45
20.9	15.10	59.75	21.0	57.58	21.30	21.0	34.68	58.20	21.1	18.42	14.79	21.1	11.11	48.11
21.9	15.16	59.42	22.0	57.63	20.96	22.0	34.69	57.86	22.1	18.24	14.45	22.1	11.06	47.78
22.9	15.20	59.08	23.0	57.65	20.62	23.0	34.69	57.51	23.1	18.11	14.11	23.1	11.00	47.44
23.9	15.24	58.71	23.9	57.66	20.25	24.0	34.68	57.15	24.0	18.03	13.79	24.1	10.94	47.10
24.9	15.28	58.35	24.9	57.67	19.87	25.0	34.67	56.79	25.0	17.97	13.47	25.1	10.86	46.77
25.9	15.34	57.97	25.9	57.70	19.47	26.0	34.67	56.38	26.0	17.92	13.15	26.1	10.78	46.40
26.9	15.39	57.57	26.9	57.73	19.06	27.0	34.66	55.98	27.0	17.87	12.88	27.1	10.73	46.01
27.9	15.47	57.16	27.9	57.78	18.65	28.0	34.67	55.57	28.0	17.82	12.60	28.1	10.68	45.60
28.9	15.56	56.76	28.9	57.87	18.22	29.0	34.70	55.15	29.0	17.75	12.33	29.0	10.64	45.19
29.9	15.65	56.38	29.9	57.99	17.79	29.9	34.73	54.74	30.0	17.67	12.05	30.0	10.61	44.78
30.9	15.75	56.02	30.9	58.12	17.39	30.9	34.78	54.34	31.0	17.58	11.77	31.0	10.60	44.37
31.9	15.87	55.65	31.9	58.25	17.01	31.9	34.83	53.95	32.0	17.48	11.46	32.0	10.59	43.99
8.32	-8.26		15.88	-15.85		7.03	-6.95		18.22	+18.20		7.64	-7.58	
21 ^h 38 ^m	19°.542		22 ^h 16 ^m	8°.656		22 ^h 37 ^m	39°.016		23 ^h 27 ^m	44°.125		23 ^h 47 ^m	16°.424	
-83° 6'	6''.99		-86° 23'	27''.13		-81° 49'	2''.34		+86° 50'	58''.89		-82° 28'	48''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m 0 56	° ' " +85 48	Mar.	h m 1 29	° ' " +88 51	Mar.	h m 1 41	° ' " -85 11	Mar.	h m 4 10	° ' " +85 20	Mar.	h m 5 35	° ' " +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.1	56.37	66.52	0.1	32.33	67.24	0.1	52.48	25.59	0.2	8.74	36.00	0.3	26.04	52.00
1.1	56.24	66.29	1.1	31.69	67.02	1.1	52.27	25.26	1.2	8.53	35.98	1.3	25.83	52.08
2.1	56.09	66.05	2.1	31.00	66.82	2.1	52.07	24.93	2.2	8.30	35.95	2.3	25.63	52.16
3.1	55.92	65.80	3.1	30.27	66.61	3.1	51.88	24.60	3.2	8.07	35.94	3.3	25.40	52.26
4.1	55.75	65.56	4.1	29.51	66.39	4.1	51.71	24.26	4.2	7.82	35.93	4.3	25.18	52.35
5.1	55.58	65.29	5.1	28.72	66.16	5.1	51.55	23.94	5.2	7.55	35.89	5.3	24.94	52.44
6.1	55.40	65.03	6.1	27.93	65.92	6.1	51.40	23.64	6.2	7.27	35.85	6.3	24.67	52.53
7.1	55.22	64.74	7.1	27.18	65.65	7.1	51.25	23.34	7.2	7.00	35.79	7.3	24.41	52.58
8.1	55.07	64.42	8.1	26.45	65.36	8.1	51.08	23.06	8.2	6.71	35.71	8.3	24.14	52.64
9.1	54.93	64.11	9.1	25.79	65.07	9.1	50.91	22.76	9.2	6.44	35.62	9.3	23.86	52.69
10.1	54.82	63.78	10.1	25.19	64.78	10.1	50.74	22.47	10.2	6.17	35.49	10.3	23.59	52.68
11.1	54.72	63.44	11.1	24.69	64.46	11.1	50.55	22.18	11.2	5.92	35.35	11.3	23.32	52.67
12.1	54.63	63.13	12.1	24.25	64.17	12.1	50.37	21.90	12.2	5.68	35.20	12.3	23.06	52.63
13.1	54.58	62.83	13.1	23.86	63.89	13.1	50.18	21.60	13.2	5.46	35.06	13.3	22.83	52.59
14.1	54.53	62.54	14.1	23.50	63.61	14.1	49.99	21.25	14.2	5.27	34.92	14.3	22.62	52.55
15.1	54.48	62.27	15.1	23.14	63.36	15.1	49.80	20.90	15.2	5.07	34.81	15.3	22.42	52.53
16.1	54.40	62.03	16.1	22.75	63.11	16.1	49.65	20.52	16.2	4.88	34.70	16.2	22.21	52.52
17.1	54.32	61.77	17.1	22.30	62.89	17.1	49.51	20.13	17.2	4.68	34.60	17.2	22.01	52.53
18.1	54.22	61.52	18.1	21.78	62.66	18.1	49.40	19.73	18.2	4.45	34.51	18.2	21.79	52.57
19.0	54.12	61.26	19.1	21.23	62.40	19.1	49.29	19.36	19.2	4.23	34.42	19.2	21.55	52.60
20.0	54.01	60.96	20.1	20.69	62.13	20.1	49.18	19.00	20.2	3.98	34.32	20.2	21.29	52.61
21.0	53.91	60.63	21.1	20.18	61.82	21.1	49.07	18.64	21.2	3.73	34.19	21.2	21.01	52.58
22.0	53.85	60.29	22.1	19.73	61.48	22.1	48.96	18.33	22.2	3.47	34.01	22.2	20.74	52.53
23.0	53.79	59.92	23.1	19.40	61.14	23.1	48.83	18.00	23.2	3.22	33.78	23.2	20.47	52.44
24.0	53.78	59.58	24.1	19.15	60.79	24.1	48.68	17.69	24.2	3.01	33.57	24.2	20.23	52.34
25.0	53.77	59.25	25.1	19.00	60.45	25.1	48.54	17.38	25.2	2.81	33.35	25.2	19.98	52.23
26.0	53.78	58.93	26.1	18.89	60.13	26.1	48.39	17.04	26.2	2.63	33.15	26.2	19.75	52.11
27.0	53.79	58.65	27.1	18.79	59.85	27.1	48.24	16.66	27.2	2.46	32.94	27.2	19.56	52.00
28.0	53.82	58.37	28.0	18.67	59.58	28.1	48.10	16.27	28.2	2.29	32.76	28.2	19.35	51.90
29.0	53.83	58.09	29.0	18.51	59.30	29.1	48.01	15.88	29.2	2.13	32.58	29.2	19.15	51.81
30.0	53.82	57.81	30.0	18.31	59.03	30.0	47.91	15.47	30.2	1.96	32.43	30.2	18.95	51.76
31.0	53.79	57.53	31.0	18.08	58.77	31.0	47.85	15.07	31.2	1.77	32.26	31.2	18.72	51.69
13.71 +13.67			50.60 +50.59			11.92 -11.88			12.32 +12.28			11.86 +11.82		
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Menae. Mag. 6.2			5 Menae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m 5 46	° ' -84 50	Mar.	h m 6 46	° ' -80 43	Mar.	h m 7 2	° ' +87 11	Mar.	h m 7 13	° ' +82 34	Mar.	h m 7 16	° ' -86 54
	s "	"		s "	"		s "	"		s "	"		s "	"
0.3	13.43	1.76	0.3	60.13	54.00	0.4	35.56	9.73	0.4	55.60	43.28	0.4	24.11	21.82
1.3	13.14	1.87	1.3	59.98	54.20	1.4	35.27	9.90	1.4	55.49	43.45	1.4	23.68	22.06
2.3	12.84	1.93	2.3	59.83	54.39	2.3	34.98	10.08	2.4	55.40	43.64	2.4	23.24	22.30
3.3	12.54	1.99	3.3	59.69	54.54	3.3	34.67	10.26	3.4	55.29	43.84	3.4	22.81	22.49
4.3	12.26	2.02	4.3	59.54	54.69	4.3	34.35	10.46	4.4	55.17	44.05	4.4	22.39	22.68
5.3	11.97	2.05	5.3	59.40	54.83	5.3	34.01	10.66	5.3	55.05	44.25	5.3	21.96	22.85
6.3	11.70	2.08	6.3	59.26	54.95	6.3	33.64	10.86	6.3	54.92	44.45	6.3	21.55	23.01
7.3	11.44	2.11	7.3	59.11	55.08	7.3	33.23	11.06	7.3	54.78	44.66	7.3	21.15	23.18
8.3	11.17	2.14	8.3	58.98	55.20	8.3	32.82	11.24	8.3	54.63	44.85	8.3	20.76	23.35
9.3	10.91	2.18	9.3	58.84	55.33	9.3	32.39	11.39	9.3	54.47	45.01	9.3	20.38	23.53
10.3	10.64	2.23	10.3	58.70	55.49	10.3	31.96	11.53	10.3	54.31	45.16	10.3	20.01	23.72
11.3	10.38	2.32	11.3	58.56	55.64	11.3	31.53	11.65	11.3	54.15	45.31	11.3	19.62	23.92
12.3	10.10	2.38	12.3	58.43	55.80	12.3	31.11	11.75	12.3	53.99	45.41	12.3	19.21	24.13
13.3	9.81	2.45	13.3	58.28	55.96	13.3	30.72	11.82	13.3	53.85	45.50	13.3	18.79	24.34
14.3	9.51	2.50	14.3	58.13	56.12	14.3	30.35	11.89	14.3	53.72	45.59	14.3	18.35	24.55
15.3	9.20	2.52	15.3	57.97	56.27	15.3	30.01	11.97	15.3	53.59	45.68	15.3	17.88	24.75
16.3	8.88	2.53	16.3	57.81	56.38	16.3	29.68	12.07	16.3	53.48	45.79	16.3	17.39	24.91
17.3	8.57	2.51	17.3	57.65	56.47	17.3	29.35	12.18	17.3	53.36	45.91	17.3	16.89	25.06
18.3	8.28	2.47	18.3	57.49	56.53	18.3	29.00	12.30	18.3	53.24	46.04	18.3	16.40	25.18
19.2	7.99	2.41	19.3	57.33	56.59	19.3	28.64	12.43	19.3	53.11	46.18	19.3	15.93	25.28
20.2	7.71	2.35	20.3	57.17	56.63	20.3	28.22	12.56	20.3	52.96	46.32	20.3	15.47	25.37
21.2	7.45	2.31	21.3	57.02	56.68	21.3	27.77	12.67	21.3	52.79	46.44	21.3	15.04	25.47
22.2	7.18	2.28	22.3	56.88	56.74	22.3	27.31	12.75	22.3	52.62	46.54	22.3	14.63	25.58
23.2	6.92	2.27	23.3	56.74	56.83	23.3	26.84	12.81	23.3	52.44	46.60	23.3	14.22	25.71
24.2	6.64	2.28	24.3	56.59	56.94	24.3	26.37	12.84	24.3	52.27	46.65	24.3	13.80	25.85
25.2	6.37	2.28	25.3	56.45	57.04	25.3	25.94	12.85	25.3	52.11	46.68	25.3	13.37	26.01
26.2	6.08	2.29	26.3	56.30	57.15	26.3	25.52	12.83	26.3	51.96	46.71	26.3	12.92	26.16
27.2	5.79	2.28	27.3	56.13	57.24	27.3	25.13	12.82	27.3	51.81	46.72	27.3	12.45	26.30
28.2	5.47	2.24	28.3	55.97	57.30	28.3	24.76	12.84	28.3	51.68	46.75	28.3	11.96	26.43
29.2	5.18	2.19	29.3	55.81	57.35	29.3	24.39	12.87	29.3	51.54	46.78	29.3	11.46	26.53
30.2	4.89	2.11	30.3	55.64	57.37	30.3	24.02	12.90	30.3	51.41	46.82	30.3	10.97	26.61
31.2	4.60	2.01	31.3	55.48	57.38	31.3	23.63	12.94	31.3	51.27	46.88	31.3	10.47	26.67
11.11	-11.06		6.21	-6.13		20.37	+20.35		7.74	+7.68		18.53	-18.51	
5 ^h 46 ^m	14°.756		6 ^h 46 ^m	58°.546		7 ^h 2 ^m	4°.048		7 ^h 13 ^m	42°.294		7 ^h 16 ^m	20°.292	
-84° 49'	46''.89		-80° 43'	38''.16		+87° 10'	54''.74		+82° 34'	30''.13		-86° 54'	6''.70	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			♄ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			♄ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m s	° ' "	Mar.	h m s	° ' "	Mar.	h m s	° ' "	Mar.	h m s	° ' "	Mar.	h m s	° ' "
0.4	78.41	7.70	0.4	6.50	10.20	0.5	35.65	39.94	0.5	27.98	19.08	0.5	20.55	46.29
1.4	77.89	7.94	1.4	6.35	10.58	1.5	35.62	40.19	1.5	27.94	19.48	1.5	20.55	46.56
2.4	77.38	8.21	2.4	6.18	10.95	2.5	35.60	40.47	2.5	27.88	19.86	2.5	20.57	46.84
3.4	76.87	8.46	3.4	6.01	11.29	3.4	35.58	40.75	3.5	27.82	20.24	3.5	20.58	47.15
4.4	76.30	8.73	4.4	5.82	11.62	4.4	35.56	41.06	4.5	27.75	20.60	4.5	20.58	47.46
5.4	75.68	9.02	5.4	5.65	11.93	5.4	35.52	41.37	5.4	27.68	20.93	5.5	20.59	47.77
6.4	75.01	9.30	6.4	5.48	12.23	6.4	35.48	41.69	6.4	27.61	21.26	6.5	20.57	48.11
7.4	74.28	9.57	7.4	5.30	12.52	7.4	35.42	42.00	7.4	27.54	21.59	7.5	20.54	48.44
8.4	73.47	9.82	8.4	5.15	12.81	8.4	35.35	42.31	8.4	27.48	21.90	8.5	20.52	48.78
9.4	72.60	10.07	9.4	5.00	13.12	9.4	35.27	42.60	9.4	27.41	22.21	9.5	20.47	49.12
10.4	71.71	10.30	10.4	4.84	13.44	10.4	35.19	42.89	10.4	27.35	22.54	10.5	20.41	49.44
11.4	70.79	10.49	11.4	4.69	13.77	11.4	35.10	43.17	11.4	27.30	22.91	11.5	20.34	49.76
12.4	69.88	10.68	12.4	4.54	14.12	12.4	35.01	43.42	12.4	27.25	23.28	12.5	20.28	50.04
13.4	69.02	10.85	13.4	4.38	14.48	13.4	34.93	43.65	13.4	27.18	23.65	13.5	20.22	50.32
14.4	68.22	10.99	14.4	4.20	14.84	14.4	34.86	43.86	14.4	27.11	24.04	14.5	20.16	50.56
15.4	67.46	11.16	15.4	4.01	15.18	15.4	34.80	44.09	15.4	27.03	24.42	15.5	20.11	50.81
16.4	66.79	11.34	16.4	3.79	15.52	16.4	34.75	44.32	16.4	26.96	24.79	16.4	20.07	51.06
17.4	66.11	11.53	17.4	3.56	15.84	17.4	34.69	44.55	17.4	26.87	25.13	17.4	20.04	51.32
18.4	65.41	11.73	18.4	3.32	16.12	18.4	34.64	44.81	18.4	26.77	25.45	18.4	20.01	51.60
19.4	64.64	11.95	19.4	3.09	16.39	19.4	34.57	45.09	19.4	26.67	25.74	19.4	19.98	51.92
20.4	63.79	12.17	20.4	2.85	16.65	20.4	34.49	45.36	20.4	26.57	26.02	20.4	19.93	52.23
21.3	62.83	12.40	21.4	2.64	16.90	21.4	34.40	45.61	21.4	26.48	26.29	21.4	19.85	52.54
22.3	61.82	12.58	22.4	2.44	17.16	22.4	34.30	45.89	22.4	26.40	26.58	22.4	19.77	52.84
23.3	60.74	12.74	23.4	2.25	17.42	23.4	34.18	46.13	23.4	26.32	26.86	23.4	19.67	53.13
24.3	59.66	12.88	24.4	2.07	17.73	24.4	34.05	46.35	24.4	26.24	27.18	24.4	19.56	53.42
25.3	58.61	12.97	25.4	1.88	18.04	25.4	33.95	46.55	25.4	26.17	27.51	25.4	19.46	53.67
26.3	57.61	13.07	26.4	1.69	18.35	26.4	33.84	46.73	26.4	26.09	27.85	26.4	19.35	53.91
27.3	56.66	13.16	27.4	1.47	18.65	27.4	33.74	46.90	27.4	26.00	28.18	27.4	19.26	54.13
28.3	55.76	13.26	28.4	1.23	18.94	28.4	33.65	47.06	28.4	25.91	28.51	28.4	19.17	54.35
29.3	54.88	13.38	29.4	0.99	19.22	29.4	33.55	47.24	29.4	25.81	28.81	29.4	19.09	54.57
30.3	54.01	13.50	30.4	0.72	19.49	30.4	33.47	47.43	30.4	25.70	29.10	30.4	19.02	54.82
31.3	53.12	13.62	31.4	0.46	19.72	31.4	33.38	47.63	31.4	25.59	29.37	31.4	18.94	55.08
51.46	+51.45		12.30	-12.26		6.92	+6.85		6.11	-6.02		8.18	+8.12	
8 ^h 15 ^m 48 ^s .380			9 ^h 8 ^m 57 ^s .938			9 ^h 25 ^m 21 ^s .719			9 ^h 36 ^m 22 ^s .347			10 ^h 21 ^m 4 ^s .831		
+88° 53' 0".29			-85° 19' 57".45			+81° 41' 41".50			-80° 34' 6".83			+82° 58' 54".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1673. Mag. 6.3			1 Octantis. Mag. 5.4			33 H. Camelopard. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
Mar. 11 0	-84 8		Mar. 12 15	+88 9		Mar. 12 46	-84 40		Mar. 12 48	+83 51		Mar. 13 27	-85 21	
0.5	5.49	58.18	0.6	10.68	17.45	0.6	19.40	23.32	0.6	42.40	28.62	0.6	28.27	40.47
1.5	5.50	58.61	1.6	10.96	17.71	1.6	19.55	23.70	1.6	42.51	28.84	1.6	28.50	40.79
2.5	5.49	59.04	2.6	11.27	17.97	2.6	19.69	24.09	2.6	42.64	29.07	2.6	28.70	41.16
3.5	5.48	59.46	3.6	11.58	18.23	3.6	19.79	24.49	3.6	42.77	29.31	3.6	28.88	41.50
4.5	5.45	59.85	4.6	11.89	18.50	4.6	19.90	24.86	4.6	42.89	29.57	4.6	29.06	41.85
5.5	5.42	60.23	5.6	12.21	18.80	5.6	20.00	25.22	5.6	43.01	29.84	5.6	29.21	42.19
6.5	5.39	60.61	6.6	12.49	19.11	6.6	20.08	25.57	6.6	43.12	30.12	6.6	29.35	42.53
7.5	5.36	60.97	7.6	12.74	19.43	7.6	20.17	25.91	7.6	43.23	30.43	7.6	29.51	42.84
8.5	5.35	61.32	8.5	12.95	19.76	8.6	20.26	26.25	8.6	43.32	30.75	8.6	29.66	43.14
9.5	5.33	61.69	9.5	13.13	20.10	9.6	20.36	26.58	9.6	43.40	31.08	9.6	29.81	43.44
10.5	5.33	62.05	10.5	13.25	20.46	10.6	20.47	26.91	10.6	43.47	31.40	10.6	29.98	43.73
11.5	5.32	62.42	11.5	13.35	20.79	11.6	20.60	27.27	11.6	43.53	31.72	11.6	30.18	44.04
12.5	5.31	62.83	12.5	13.39	21.11	12.6	20.72	27.63	12.6	43.58	32.02	12.6	30.37	44.36
13.5	5.31	63.24	13.5	13.44	21.41	13.6	20.84	28.00	13.6	43.63	32.31	13.6	30.57	44.72
14.5	5.30	63.66	14.5	13.48	21.69	14.6	20.96	28.39	14.6	43.68	32.60	14.6	30.77	45.08
15.5	5.26	64.08	15.5	13.57	21.97	15.6	21.07	28.81	15.6	43.73	32.84	15.6	30.95	45.47
16.5	5.22	64.51	16.5	13.67	22.25	16.5	21.17	29.23	16.5	43.79	33.10	16.6	31.10	45.86
17.5	5.15	64.94	17.5	13.81	22.51	17.5	21.23	29.66	17.5	43.88	33.35	17.6	31.24	46.26
18.5	5.07	65.34	18.5	13.98	22.79	18.5	21.29	30.05	18.5	43.96	33.62	18.6	31.36	46.65
19.5	4.99	65.72	19.5	14.14	23.11	19.5	21.33	30.44	19.5	44.03	33.91	19.6	31.47	47.03
20.5	4.91	66.06	20.5	14.26	23.43	20.5	21.36	30.82	20.5	44.09	34.23	20.6	31.56	47.39
21.5	4.85	66.41	21.5	14.33	23.77	21.5	21.40	31.18	21.5	44.15	34.56	21.6	31.65	47.73
22.5	4.79	66.75	22.5	14.34	24.11	22.5	21.45	31.52	22.5	44.19	34.91	22.6	31.76	48.07
23.5	4.73	67.11	23.5	14.29	24.48	23.5	21.51	31.87	23.5	44.20	35.26	23.6	31.89	48.40
24.5	4.69	67.47	24.5	14.19	24.82	24.5	21.60	32.23	24.5	44.21	35.60	24.6	32.03	48.73
25.5	4.65	67.83	25.5	14.06	25.14	25.5	21.68	32.61	25.5	44.21	35.93	25.6	32.18	49.08
26.4	4.61	68.22	26.5	13.94	25.43	26.5	21.77	33.00	26.5	44.20	36.23	26.5	32.33	49.44
27.4	4.56	68.62	27.5	13.83	25.72	27.5	21.84	33.41	27.5	44.20	36.52	27.5	32.48	49.83
28.4	4.48	69.01	28.5	13.74	26.01	28.5	21.90	33.82	28.5	44.20	36.81	28.5	32.61	50.22
29.4	4.40	69.41	29.5	13.68	26.29	29.5	21.95	34.23	29.5	44.22	37.10	29.5	32.71	50.63
30.4	4.29	69.80	30.5	13.63	26.56	30.5	21.96	34.65	30.5	44.24	37.37	30.5	32.81	51.04
31.4	4.19	70.16	31.5	13.59	26.87	31.5	21.97	35.04	31.5	44.26	37.66	31.5	32.87	51.43
9.81	-9.76		31.08	+31.06		10.77	-10.73		9.35	+9.29		12.37	-12.33	
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 3283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Mar. 14 13	-83 17		Mar. 15 3	+87 32		Mar. 15 24	-84 11		Mar. 16 54	+82 10		Mar. 17 15	-80 46	
0.7	37.27	16.69	0.7	46.19	43.38	0.7	5.83	21.97	0.8	21.96	7.09	0.8	58.90	54.37
1.6	37.46	16.98	1.7	46.60	43.48	1.7	6.10	22.16	1.8	22.11	7.06	1.8	59.08	54.36
2.6	37.64	17.29	2.7	47.05	43.58	2.7	6.36	22.35	2.8	22.27	7.02	2.8	59.27	54.37
3.6	37.81	17.59	3.7	47.51	43.69	3.7	6.60	22.56	3.8	22.44	6.97	3.8	59.45	54.38
4.6	37.96	17.88	4.7	47.98	43.81	4.7	6.83	22.77	4.8	22.60	6.93	4.8	59.62	54.42
5.6	38.10	18.19	5.7	48.48	43.94	5.7	7.05	22.97	5.8	22.77	6.88	5.8	59.78	54.45
6.6	38.25	18.47	6.7	48.96	44.09	6.7	7.25	23.18	6.7	22.94	6.87	6.8	59.95	54.49
7.6	38.38	18.75	7.7	49.45	44.25	7.7	7.46	23.37	7.7	23.11	6.86	7.8	60.09	54.52
8.6	38.53	19.02	8.7	49.93	44.43	8.7	7.67	23.55	8.7	23.28	6.87	8.8	60.24	54.53
9.6	38.67	19.27	9.7	50.38	44.62	9.7	7.88	23.71	9.7	23.45	6.91	9.8	60.39	54.54
10.6	38.81	19.52	10.7	50.81	44.84	10.7	8.09	23.87	10.7	23.62	6.97	10.8	60.54	54.53
11.6	38.99	19.78	11.7	51.20	45.06	11.7	8.32	24.04	11.7	23.77	7.05	11.7	60.71	54.52
12.6	39.15	20.05	12.7	51.56	45.28	12.7	8.56	24.21	12.7	23.92	7.13	12.7	60.88	54.51
13.6	39.32	20.33	13.7	51.90	45.49	13.7	8.81	24.40	13.7	24.07	7.22	13.7	61.06	54.50
14.6	39.50	20.65	14.6	52.22	45.69	14.7	9.07	24.62	14.7	24.22	7.30	14.7	61.25	54.50
15.6	39.68	20.98	15.6	52.56	45.87	15.7	9.33	24.85	15.7	24.37	7.35	15.7	61.43	54.55
16.6	39.83	21.34	16.6	52.90	46.02	16.7	9.57	25.12	16.7	24.50	7.40	16.7	61.63	54.62
17.6	39.97	21.70	17.6	53.27	46.18	17.7	9.80	25.40	17.7	24.66	7.43	17.7	61.81	54.70
18.6	40.11	22.06	18.6	53.68	46.35	18.7	10.00	25.68	18.7	24.80	7.46	18.7	61.99	54.80
19.6	40.21	22.40	19.6	54.09	46.52	19.7	10.20	25.94	19.7	24.98	7.50	19.7	62.16	54.91
20.6	40.32	22.74	20.6	54.50	46.73	20.6	10.38	26.20	20.7	25.14	7.56	20.7	62.31	55.02
21.6	40.42	23.04	21.6	54.89	46.96	21.6	10.56	26.44	21.7	25.30	7.65	21.7	62.45	55.10
22.6	40.53	23.34	22.6	55.27	47.24	22.6	10.75	26.66	22.7	25.47	7.77	22.7	62.60	55.15
23.6	40.66	23.62	23.6	55.60	47.52	23.6	10.93	26.85	23.7	25.61	7.91	23.7	62.74	55.20
24.6	40.80	23.92	24.6	55.89	47.80	24.6	11.16	27.06	24.7	25.76	8.09	24.7	62.91	55.24
25.6	40.94	24.23	25.6	56.16	48.07	25.6	11.37	27.29	25.7	25.91	8.26	25.7	63.08	55.28
26.6	41.09	24.54	26.6	56.40	48.34	26.6	11.60	27.53	26.7	26.05	8.43	26.7	63.26	55.33
27.6	41.24	24.89	27.6	56.64	48.59	27.6	11.82	27.79	27.7	26.17	8.57	27.7	63.44	55.41
28.6	41.37	25.25	28.6	56.90	48.82	28.6	12.05	28.06	28.7	26.31	8.72	28.7	63.62	55.50
29.6	41.50	25.62	29.6	57.17	49.06	29.6	12.25	28.35	29.7	26.44	8.84	29.7	63.81	55.62
30.6	41.60	25.99	30.6	57.43	49.28	30.6	12.45	28.65	30.7	26.58	8.96	30.7	63.98	55.75
31.6	41.70	26.36	31.6	57.73	49.51	31.6	12.62	28.96	31.7	26.72	9.09	31.7	64.14	55.89
8.56	-8.50		23.36	+23.33		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m 27 ^s .793			15 ^h 3 ^m 41 ^s .175			15 ^h 23 ^m 56 ^s .594			16 ^h 54 ^m 25 ^s .488			17 ^h 15 ^m 54 ^s .896		
-83° 17' 21".03			+87° 33' 10".52			-84° 11' 30".39			+82° 10' 32".75			-80° 47' 6".56		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "
	17 58	+86 36		18 6	-87 39		19 1	+89 0		19 27	-89 13		20 48	+82 13
0.8	43.80	29.86	0.8	18.14	37.50	0.9	16.00	46.48	0.9	32.15	13.92	0.9	29.01	24.88
1.8	44.11	29.76	1.8	18.83	37.39	1.8	16.87	46.31	1.9	33.86	13.68	1.9	29.07	24.61
2.8	44.42	29.62	2.8	19.50	37.31	2.8	17.75	46.12	2.9	35.59	13.46	2.9	29.14	24.34
3.8	44.74	29.49	3.8	20.16	37.25	3.8	18.67	45.92	3.9	37.30	13.26	3.9	29.21	24.05
4.8	45.08	29.39	4.8	20.80	37.18	4.8	19.65	45.71	4.9	38.99	13.07	4.9	29.29	23.75
5.8	45.44	29.26	5.8	21.41	37.13	5.8	20.70	45.52	5.9	40.62	12.88	5.9	29.37	23.44
6.8	45.81	29.14	6.8	22.01	37.08	6.8	21.80	45.33	6.9	42.20	12.70	6.9	29.45	23.13
7.8	46.20	29.04	7.8	22.59	37.02	7.8	22.96	45.14	7.9	43.72	12.53	7.9	29.54	22.83
8.8	46.59	28.97	8.8	23.16	36.95	8.8	24.17	44.98	8.8	45.19	12.33	8.9	29.64	22.55
9.8	46.97	28.92	9.8	23.73	36.87	9.8	25.42	44.83	9.8	46.65	12.13	9.9	29.75	22.29
10.8	47.37	28.88	10.8	24.32	36.78	10.8	26.67	44.72	10.8	48.13	11.90	10.9	29.87	22.03
11.8	47.74	28.87	11.8	24.91	36.67	11.8	27.90	44.61	11.8	49.65	11.68	11.9	29.99	21.79
12.8	48.11	28.86	12.8	25.55	36.57	12.8	29.08	44.52	12.8	51.26	11.46	12.9	30.12	21.59
13.8	48.45	28.86	13.8	26.23	36.48	13.8	30.20	44.45	13.8	52.96	11.23	13.9	30.22	21.39
14.8	48.78	28.87	14.8	26.92	36.41	14.8	31.25	44.39	14.8	54.79	11.02	14.9	30.33	21.21
15.8	49.10	28.86	15.8	27.63	36.35	15.8	32.25	44.30	15.8	56.72	10.82	15.9	30.45	21.01
16.8	49.41	28.82	16.8	28.37	36.33	16.8	33.22	44.19	16.8	58.70	10.64	16.9	30.54	20.80
17.8	49.74	28.77	17.8	29.09	36.33	17.8	34.22	44.06	17.8	60.68	10.50	17.9	30.64	20.58
18.8	50.08	28.72	18.8	29.76	36.35	18.8	35.28	43.93	18.8	62.61	10.37	18.9	30.74	20.34
19.8	50.44	28.67	19.8	30.42	36.36	19.8	36.42	43.80	19.8	64.46	10.25	19.9	30.85	20.10
20.8	50.82	28.63	20.8	31.03	36.39	20.8	37.64	43.68	20.8	66.18	10.13	20.9	30.97	19.85
21.8	51.21	28.63	21.8	31.61	36.40	21.8	38.94	43.58	21.8	67.83	10.01	21.9	31.10	19.61
22.7	51.61	28.67	22.8	32.18	36.38	22.8	40.28	43.52	22.8	69.43	9.88	22.9	31.23	19.40
23.7	52.00	28.71	23.8	32.78	36.34	23.8	41.63	43.48	23.8	71.01	9.72	23.9	31.38	19.21
24.7	52.38	28.80	24.7	33.38	36.30	24.8	42.94	43.47	24.8	72.67	9.55	24.9	31.52	19.06
25.7	52.72	28.88	25.7	34.04	36.26	25.8	44.18	43.46	25.8	74.41	9.38	25.9	31.68	18.90
26.7	53.06	28.97	26.7	34.72	36.22	26.8	45.36	43.46	26.8	76.24	9.21	26.9	31.82	18.76
27.7	53.40	29.03	27.7	35.42	36.21	27.8	46.48	43.45	27.8	78.17	9.06	27.9	31.96	18.63
28.7	53.71	29.10	28.7	36.12	36.22	28.8	47.57	43.44	28.8	80.14	8.92	28.9	32.10	18.51
29.7	54.04	29.16	29.7	36.82	36.26	29.8	48.67	43.42	29.8	82.15	8.82	29.8	32.22	18.37
30.7	54.37	29.20	30.7	37.49	36.32	30.8	49.78	43.38	30.8	84.14	8.73	30.8	32.34	18.22
31.7	54.71	29.25	31.7	38.16	36.38	31.8	50.93	43.34	31.8	86.08	8.64	31.8	32.48	18.05
16.90	+16.87		24.49	-24.47		58.01	+58.00		73.43	-73.42		7.39	+7.32	
17 ^h 59 ^m	1° 30'		18 ^h 6 ^m 11 ^s .893			19 ^h 2 ^m 39 ^s .624			19 ^h 27 ^m 42 ^s .218			20 ^h 48 ^m 40 ^s .494		
+86° 36'	51° 17'		-87° 39'	51° 17'.82		+89° 1'	2° 17'		-89° 13'	28° 57'		+82° 13'	29° 8.86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Mar. 21 38	-83 5		Mar. 22 15	-86 23		Mar. 22 37	-81 48		Mar. 23 27	+86 51		Mar. 23 47	-82 28	
0.9	15.56	56.76	0.9	57.87	18.22	1.0	34.70	55.15	1.0	17.75	12.33	1.0	10.64	45.19
1.9	15.65	56.38	1.9	57.99	17.79	1.9	34.73	54.74	2.0	17.67	12.05	2.0	10.61	44.78
2.9	15.75	56.02	2.9	58.12	17.39	2.9	34.78	54.34	3.0	17.58	11.77	3.0	10.60	44.37
3.9	15.87	55.65	3.9	58.25	17.01	3.9	34.83	53.95	4.0	17.48	11.46	4.0	10.59	43.99
4.9	15.98	55.32	4.9	58.38	16.65	4.9	34.87	53.57	5.0	17.39	11.15	5.0	10.58	43.60
5.9	16.08	54.99	5.9	58.52	16.29	5.9	34.92	53.21	6.0	17.29	10.81	6.0	10.57	43.23
6.9	16.18	54.67	6.9	58.65	15.96	6.9	34.96	52.87	7.0	17.22	10.47	7.0	10.56	42.87
7.9	16.28	54.36	7.9	58.75	15.62	7.9	35.01	52.53	8.0	17.17	10.13	8.0	10.54	42.52
8.9	16.37	54.05	8.9	58.86	15.28	8.9	35.04	52.18	9.0	17.14	9.77	9.0	10.51	42.18
9.9	16.45	53.73	9.9	58.96	14.93	9.9	35.07	51.82	10.0	17.14	9.42	10.0	10.49	41.84
10.9	16.53	53.39	10.9	59.05	14.57	10.9	35.09	51.46	11.0	17.17	9.08	11.0	10.46	41.48
11.9	16.61	53.05	11.9	59.14	14.21	11.9	35.11	51.10	12.0	17.22	8.75	12.0	10.43	41.11
12.9	16.70	52.68	12.9	59.23	13.81	12.9	35.14	50.72	13.0	17.28	8.45	13.0	10.40	40.72
13.9	16.80	52.32	13.9	59.36	13.41	13.9	35.18	50.30	13.9	17.35	8.14	14.0	10.37	40.31
14.9	16.92	51.94	14.9	59.50	13.00	14.9	35.23	49.88	14.9	17.40	7.86	15.0	10.37	39.87
15.9	17.05	51.56	15.9	59.68	12.60	15.9	35.31	49.47	15.9	17.44	7.60	16.0	10.38	39.44
16.9	17.20	51.19	16.9	59.89	12.19	16.9	35.39	49.07	16.9	17.45	7.32	17.0	10.40	39.01
17.9	17.36	50.85	17.9	60.13	11.81	17.9	35.48	48.67	17.9	17.45	7.03	18.0	10.43	38.58
18.9	17.51	50.53	18.9	60.35	11.47	18.9	35.56	48.29	18.9	17.45	6.72	19.0	10.47	38.17
19.9	17.66	50.25	19.9	60.56	11.13	19.9	35.65	47.95	19.9	17.45	6.41	19.9	10.50	37.78
20.9	17.79	49.97	20.9	60.76	10.80	20.9	35.72	47.62	20.9	17.49	6.08	20.9	10.53	37.42
21.9	17.92	49.69	21.9	60.94	10.48	21.9	35.78	47.30	21.9	17.55	5.73	21.9	10.55	37.06
22.9	18.02	49.40	22.9	61.09	10.16	22.9	35.84	46.96	22.9	17.64	5.39	22.9	10.55	36.73
23.9	18.13	49.08	23.9	61.24	9.82	23.9	35.90	46.62	23.9	17.78	5.05	23.9	10.55	36.37
24.9	18.24	48.75	24.9	61.39	9.46	24.9	35.96	46.26	24.9	17.93	4.73	24.9	10.55	36.00
25.9	18.36	48.40	25.9	61.55	9.09	25.9	36.00	45.88	25.9	18.09	4.45	25.9	10.55	35.59
26.9	18.49	48.06	26.9	61.73	8.72	26.9	36.08	45.49	26.9	18.24	4.17	26.9	10.56	35.19
27.9	18.64	47.73	27.9	61.95	8.35	27.9	36.16	45.10	27.9	18.39	3.90	27.9	10.59	34.78
28.9	18.81	47.40	28.9	62.19	7.97	28.9	36.24	44.72	28.9	18.53	3.64	28.9	10.62	34.35
29.9	18.98	47.08	29.9	62.43	7.62	29.9	36.34	44.34	29.9	18.66	3.38	29.9	10.67	33.94
30.9	19.15	46.78	30.9	62.69	7.29	30.9	36.45	43.99	30.9	18.76	3.10	30.9	10.73	33.53
31.9	19.32	46.51	31.9	62.96	6.95	31.9	36.56	43.65	31.9	18.87	2.81	31.9	10.79	33.14
8.32	-8.26		15.87	-15.84		7.02	-6.95		18.21	+18.18		7.64	-7.57	
21 ^h 38 ^m 19 ^s .542			22 ^h 16 ^m 8 ^s .656			22 ^h 37 ^m 39 ^s .016			23 ^h 27 ^m 44 ^s .125			23 ^h 47 ^m 16 ^s .424		
-83° 6' 6".99			-86° 23' 27".13			-81° 49' 2".34			+86° 50' 58".89			-82° 28' 48".42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursa Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m	s	Apr.	h m	s	Apr.	h m	s	Apr.	h m	s	Apr.	h m	s
0 56	0 56	+85 48	1 29	1 29	+88 51	1 41	1 41	-85 11	4 9	4 9	+85 20	5 35	5 35	+85 9
0.0	53.79	57.53	0.0	18.08	58.77	0.0	47.85	15.07	0.2	61.77	32.26	0.2	18.72	51.69
1.0	53.76	57.21	1.0	17.83	58.48	1.0	47.78	14.68	1.1	61.57	32.08	1.2	18.50	51.62
2.0	53.75	56.90	2.0	17.57	58.15	2.0	47.72	14.30	2.1	61.37	31.89	2.2	18.26	51.54
3.0	53.73	56.58	3.0	17.33	57.84	3.0	47.65	13.93	3.1	61.16	31.70	3.2	18.02	51.45
4.0	53.71	56.25	4.0	17.14	57.52	4.0	47.60	13.58	4.1	60.95	31.48	4.2	17.77	51.35
5.0	53.72	55.90	5.0	16.99	57.15	5.0	47.54	13.25	5.1	60.74	31.25	5.2	17.51	51.22
5.9	53.75	55.55	6.0	16.91	56.80	6.0	47.46	12.92	6.1	60.54	31.01	6.2	17.26	51.07
6.9	53.79	55.22	7.0	16.92	56.45	7.0	47.38	12.59	7.1	60.35	30.75	7.2	17.02	50.89
7.9	53.86	54.88	8.0	16.99	56.11	8.0	47.29	12.24	8.1	60.19	30.47	8.2	16.78	50.72
8.9	53.95	54.56	9.0	17.15	55.78	9.0	47.20	11.87	9.1	60.04	30.20	9.2	16.58	50.53
9.9	54.04	54.25	10.0	17.34	55.46	10.0	47.11	11.51	10.1	59.93	29.94	10.2	16.40	50.33
10.9	54.14	53.97	11.0	17.54	55.16	11.0	47.03	11.11	11.1	59.82	29.69	11.2	16.22	50.15
11.9	54.24	53.71	12.0	17.71	54.89	12.0	46.97	10.70	12.1	59.72	29.44	12.2	16.07	49.96
12.9	54.32	53.46	13.0	17.84	54.62	13.0	46.92	10.29	13.1	59.61	29.22	13.2	15.90	49.81
13.9	54.38	53.20	14.0	17.92	54.36	14.0	46.91	9.86	14.1	59.48	29.01	14.2	15.73	49.69
14.9	54.43	52.93	14.9	17.94	54.08	15.0	46.91	9.45	15.1	59.35	28.81	15.2	15.56	49.56
15.9	54.48	52.65	15.9	17.95	53.80	16.0	46.90	9.04	16.1	59.21	28.58	16.2	15.36	49.43
16.9	54.52	52.36	16.9	17.98	53.49	17.0	46.90	8.66	17.1	59.05	28.35	17.2	15.14	49.27
17.9	54.58	52.04	17.9	18.06	53.16	17.9	46.91	8.33	18.1	58.89	28.09	18.2	14.92	49.08
18.9	54.67	51.71	18.9	18.24	52.82	18.9	46.88	7.98	19.1	58.74	27.79	19.2	14.72	48.88
19.9	54.80	51.38	19.9	18.53	52.46	19.9	46.85	7.64	20.1	58.61	27.47	20.2	14.51	48.64
20.9	54.95	51.06	20.9	18.89	52.13	20.9	46.82	7.29	21.1	58.51	27.14	21.2	14.31	48.37
21.9	55.11	50.78	21.9	19.35	51.82	21.9	46.78	6.92	22.1	58.44	26.82	22.1	14.16	48.12
22.9	55.28	50.50	22.9	19.81	51.52	22.9	46.74	6.55	23.1	58.38	26.50	23.1	14.01	47.88
23.9	55.45	50.25	23.9	20.27	51.25	23.9	46.72	6.17	24.1	58.33	26.22	24.1	13.88	47.63
24.9	55.61	50.02	24.9	20.69	50.98	24.9	46.71	5.77	25.1	58.27	25.94	25.1	13.76	47.41
25.9	55.76	49.78	25.9	21.07	50.71	25.9	46.72	5.36	26.1	58.22	25.67	26.1	13.63	47.21
26.9	55.89	49.54	26.9	21.41	50.45	26.9	46.75	4.96	27.1	58.15	25.43	27.1	13.50	47.01
27.9	56.01	49.31	27.9	21.71	50.19	27.9	46.78	4.57	28.1	58.07	25.19	28.1	13.35	46.81
28.9	56.14	49.06	28.9	22.00	49.93	28.9	46.83	4.18	29.1	57.98	24.93	29.1	13.20	46.60
29.9	56.26	48.79	29.9	22.31	49.65	29.9	46.88	3.80	30.1	57.88	24.66	30.1	13.03	46.41
30.9	56.39	48.51	30.9	22.64	49.34	30.9	46.93	3.44	31.1	57.79	24.38	31.1	12.86	46.18
13.70	+13.67		50.48	+50.47		11.92	-11.87		12.31	+12.27		11.86	+11.82	
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Apr. 5 45	-84 49	"	Apr. 6 46	-80 43	"	Apr. 7 2	+87 11	"	Apr. 7 13	+82 34	"	Apr. 7 15	-86 54	"
0.2	64.60	62.01	0.3	55.48	57.38	0.3	23.63	12.94	0.3	51.27	46.88	0.3	70.47	26.67
1.2	64.32	61.91	1.3	55.33	57.38	1.3	23.22	12.98	1.3	51.12	46.94	1.3	69.99	26.70
2.2	64.06	61.78	2.3	55.18	57.36	2.3	22.78	13.02	2.3	50.96	47.00	2.3	69.53	26.73
3.2	63.80	61.67	3.3	55.03	57.34	3.3	22.34	13.05	3.3	50.79	47.05	3.3	69.08	26.77
4.2	63.55	61.56	4.2	54.88	57.32	4.3	21.89	13.08	4.3	50.62	47.10	4.3	68.64	26.81
5.2	63.30	61.46	5.2	54.74	57.32	5.3	21.42	13.08	5.3	50.45	47.11	5.3	68.21	26.84
6.2	63.05	61.36	6.2	54.60	57.32	6.3	20.94	13.05	6.3	50.27	47.10	6.3	67.79	26.89
7.2	62.80	61.31	7.2	54.45	57.33	7.3	20.47	13.01	7.3	50.09	47.07	7.3	67.37	26.94
8.2	62.53	61.24	8.2	54.30	57.37	8.2	20.01	12.94	8.3	49.91	47.03	8.3	66.93	27.02
9.2	62.27	61.17	9.2	54.16	57.40	9.2	19.58	12.85	9.3	49.75	46.98	9.3	66.49	27.10
10.2	62.00	61.09	10.2	54.01	57.42	10.2	19.19	12.76	10.3	49.60	46.90	10.3	66.03	27.18
11.2	61.71	60.99	11.2	53.86	57.43	11.2	18.81	12.68	11.2	49.47	46.83	11.2	65.53	27.24
12.2	61.43	60.86	12.2	53.70	57.42	12.2	18.46	12.61	12.2	49.33	46.77	12.2	65.03	27.29
13.2	61.14	60.72	13.2	53.55	57.38	13.2	18.12	12.55	13.2	49.21	46.73	13.2	64.52	27.32
14.2	60.87	60.53	14.2	53.39	57.30	14.2	17.77	12.50	14.2	49.09	46.71	14.2	64.01	27.33
15.2	60.60	60.35	15.2	53.23	57.21	15.2	17.41	12.47	15.2	48.95	46.70	15.2	63.51	27.29
16.2	60.36	60.16	16.2	53.08	57.11	16.2	17.01	12.43	16.2	48.80	46.69	16.2	63.04	27.25
17.2	60.13	59.98	17.2	52.93	57.01	17.2	16.59	12.38	17.2	48.64	46.66	17.2	62.60	27.21
18.2	59.90	59.81	18.2	52.79	56.94	18.2	16.14	12.31	18.2	48.47	46.62	18.2	62.17	27.18
19.2	59.68	59.66	19.2	52.65	56.88	19.2	15.68	12.23	19.2	48.31	46.54	19.2	61.75	27.17
20.2	59.44	59.52	20.2	52.51	56.84	20.2	15.23	12.10	20.2	48.13	46.42	20.2	61.35	27.17
21.2	59.21	59.39	21.2	52.36	56.81	21.2	14.81	11.93	21.2	47.97	46.29	21.2	60.93	27.17
22.2	58.97	59.27	22.2	52.23	56.77	22.2	14.42	11.75	22.2	47.82	46.16	22.2	60.48	27.18
23.2	58.72	59.14	23.2	52.08	56.72	23.2	14.06	11.60	23.2	47.68	46.01	23.2	60.02	27.19
24.2	58.45	59.00	24.2	51.93	56.66	24.2	13.72	11.46	24.2	47.56	45.86	24.2	59.55	27.18
25.1	58.20	58.81	25.2	51.78	56.57	25.2	13.39	11.32	25.2	47.44	45.75	25.2	59.08	27.16
26.1	57.96	58.62	26.2	51.63	56.46	26.2	13.07	11.19	26.2	47.32	45.64	26.2	58.59	27.11
27.1	57.71	58.39	27.2	51.49	56.33	27.2	12.74	11.08	27.2	47.20	45.54	27.2	58.11	27.04
28.1	57.48	58.16	28.2	51.34	56.18	28.2	12.41	10.97	28.2	47.07	45.44	28.2	57.65	26.95
29.1	57.26	57.92	29.2	51.20	56.03	29.2	12.05	10.86	29.2	46.94	45.35	29.2	57.20	26.86
30.1	57.06	57.69	30.2	51.07	55.89	30.2	11.67	10.74	30.2	46.80	45.26	30.2	56.77	26.77
31.1	56.86	57.46	31.2	50.93	55.74	31.2	11.29	10.61	31.2	46.66	45.14	31.2	56.36	26.66
11.10	-11.06		6.21	-6.13		20.37	+20.35		7.74	+7.68		18.54	-18.51	
5 ^h 46 ^m 14 ^s .756			6 ^h 46 ^m 58 ^s .546			7 ^h 2 ^m 4 ^s .048			7 ^h 13 ^m 42 ^s .294			7 ^h 16 ^m 20 ^s .292		
-84° 49' 46".89			-80° 43' 38".16			+87° 10' 54".74			+82° 34' 30".13			-86° 54' 6".70		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Apr. 8 16	+88 53		Apr. 9 8	-85 20		Apr. 9 25	+81 41		Apr. 9 36	-80 34		Apr. 10 21	+82 58	
0.3	53.12	13.62	0.4	60.46	19.72	0.4	33.38	47.63	0.4	25.59	29.37	0.4	18.94	55.08
1.3	52.19	13.76	1.4	60.21	19.94	1.4	33.29	47.84	1.4	25.47	29.63	1.4	18.86	55.34
2.3	51.21	13.89	2.4	59.96	20.15	2.4	33.19	48.06	2.4	25.36	29.87	2.4	18.77	55.60
3.3	50.17	14.02	3.3	59.71	20.35	3.4	33.07	48.29	3.4	25.25	30.10	3.4	18.67	55.89
4.3	49.07	14.17	4.3	59.46	20.55	4.4	32.94	48.52	4.4	25.14	30.32	4.4	18.56	56.17
5.3	47.93	14.27	5.3	59.23	20.75	5.4	32.82	48.72	5.4	25.04	30.56	5.4	18.43	56.44
6.3	46.76	14.36	6.3	59.00	20.95	6.4	32.68	48.89	6.4	24.94	30.80	6.4	18.30	56.68
7.3	45.58	14.43	7.3	58.78	21.17	7.4	32.53	49.05	7.4	24.84	31.03	7.4	18.15	56.91
8.3	44.40	14.49	8.3	58.56	21.40	8.3	32.39	49.20	8.4	24.74	31.28	8.4	18.01	57.13
9.3	43.27	14.50	9.3	58.34	21.65	9.3	32.26	49.32	9.4	24.65	31.55	9.4	17.87	57.32
10.3	42.21	14.51	10.3	58.09	21.90	10.3	32.13	49.43	10.3	24.55	31.83	10.4	17.72	57.50
11.3	41.22	14.53	11.3	57.84	22.14	11.3	32.01	49.53	11.3	24.44	32.11	11.4	17.60	57.67
12.3	40.28	14.54	12.3	57.56	22.39	12.3	31.91	49.62	12.3	24.31	32.37	12.4	17.50	57.82
13.3	39.38	14.57	13.3	57.28	22.59	13.3	31.80	49.74	13.3	24.19	32.61	13.4	17.39	57.99
14.3	38.48	14.60	14.3	56.98	22.78	14.3	31.71	49.87	14.3	24.06	32.84	14.4	17.29	58.16
15.3	37.55	14.65	15.3	56.69	22.93	15.3	31.61	50.01	15.3	23.93	33.03	15.4	17.19	58.35
16.3	36.56	14.71	16.3	56.39	23.08	16.3	31.48	50.13	16.3	23.80	33.21	16.4	17.07	58.56
17.3	35.47	14.76	17.3	56.12	23.23	17.3	31.35	50.29	17.3	23.67	33.37	17.4	16.94	58.79
18.3	34.31	14.80	18.3	55.85	23.36	18.3	31.21	50.43	18.3	23.55	33.53	18.4	16.80	59.00
19.3	33.10	14.82	19.3	55.61	23.49	19.3	31.06	50.56	19.3	23.44	33.69	19.4	16.63	59.20
20.3	31.89	14.80	20.3	55.38	23.66	20.3	30.91	50.66	20.3	23.33	33.87	20.4	16.46	59.35
21.3	30.70	14.76	21.3	55.14	23.83	21.3	30.75	50.74	21.3	23.23	34.05	21.3	16.29	59.50
22.3	29.56	14.69	22.3	54.90	24.01	22.3	30.60	50.79	22.3	23.12	34.28	22.3	16.13	59.63
23.3	28.50	14.62	23.3	54.64	24.19	23.3	30.47	50.82	23.3	23.00	34.50	23.3	15.98	59.73
24.3	27.50	14.55	24.3	54.37	24.38	24.3	30.33	50.85	24.3	22.88	34.71	24.3	15.83	59.82
25.3	26.55	14.48	25.3	54.08	24.54	25.3	30.22	50.89	25.3	22.76	34.91	25.3	15.69	59.92
26.3	25.61	14.43	26.3	53.79	24.68	26.3	30.10	50.93	26.3	22.63	35.09	26.3	15.56	60.04
27.2	24.68	14.40	27.3	53.49	24.79	27.3	29.98	50.99	27.3	22.49	35.24	27.3	15.43	60.17
28.2	23.71	14.37	28.3	53.19	24.89	28.3	29.87	51.07	28.3	22.36	35.37	28.3	15.30	60.29
29.2	22.72	14.35	29.3	52.90	24.96	29.3	29.74	51.15	29.3	22.22	35.48	29.3	15.17	60.42
30.2	21.68	14.33	30.3	52.60	25.04	30.3	29.61	51.22	30.3	22.08	35.58	30.3	15.02	60.56
31.2	20.60	14.29	31.3	52.32	25.10	31.3	29.47	51.29	31.3	21.95	35.67	31.3	14.86	60.69
51.50	+51.49		12.31	-12.27		6.92	+6.85		6.11	-6.03		8.19	+8.12	
8 ^h 15 ^m 48 ^s .380			9 ^h 8 ^m 57 ^s .938			9 ^h 25 ^m 21 ^s .719			9 ^h 36 ^m 22 ^s .347			10 ^h 21 ^m 4 ^s .831		
+88° 53' 0".29			-85° 19' 57".45			+81° 41' 41".50			-80° 34' 6".83			+82° 58' 54".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "	Apr.	h m	° ' "
	11 0	-84 9		12 15	+88 9		12 46	-84 40		12 48	+83 51		13 27	-85 21
	s	"		s	"		s	"		s	"		s	"
0.4	4.19	10.16	0.5	13.59	26.87	0.5	21.97	35.04	0.5	44.26	37.66	0.5	32.87	51.43
1.4	4.08	10.50	1.5	13.57	27.18	1.5	21.98	35.43	1.5	44.28	37.97	1.5	32.93	51.81
2.4	3.97	10.83	2.5	13.51	27.51	2.5	21.98	35.80	2.5	44.30	38.30	2.5	32.98	52.18
3.4	3.85	11.16	3.5	13.44	27.84	3.5	21.97	36.16	3.5	44.31	38.63	3.5	33.02	52.54
4.4	3.74	11.48	4.5	13.31	28.17	4.5	21.97	36.52	4.5	44.31	38.97	4.5	33.07	52.89
5.4	3.64	11.79	5.5	13.14	28.51	5.5	21.96	36.87	5.5	44.29	39.32	5.5	33.12	53.22
6.4	3.54	12.10	6.5	12.94	28.85	6.5	21.97	37.21	6.5	44.26	39.67	6.5	33.17	53.55
7.4	3.46	12.40	7.5	12.69	29.18	7.5	21.99	37.54	7.5	44.22	40.02	7.5	33.26	53.89
8.4	3.37	12.73	8.5	12.41	29.49	8.5	22.02	37.90	8.5	44.17	40.36	8.5	33.34	54.24
9.4	3.29	13.09	9.5	12.11	29.78	9.5	22.05	38.28	9.5	44.11	40.68	9.5	33.42	54.60
10.4	3.20	13.45	10.5	11.81	30.05	10.5	22.08	38.68	10.5	44.05	40.96	10.5	33.51	54.98
11.4	3.10	13.81	11.5	11.53	30.32	11.5	22.09	39.09	11.5	43.99	41.24	11.5	33.60	55.39
12.4	2.97	14.17	12.5	11.28	30.56	12.5	22.10	39.50	12.5	43.95	41.51	12.5	33.66	55.80
13.4	2.84	14.54	13.5	11.07	30.80	13.5	22.09	39.92	13.5	43.92	41.77	13.5	33.71	56.22
14.4	2.70	14.88	14.4	10.87	31.05	14.5	22.05	40.32	14.5	43.91	42.03	14.5	33.71	56.63
15.4	2.55	15.18	15.4	10.69	31.33	15.5	22.00	40.70	15.5	43.88	42.31	15.5	33.71	57.01
16.4	2.39	15.47	16.4	10.50	31.62	16.5	21.93	41.07	16.5	43.84	42.62	16.5	33.70	57.39
17.4	2.24	15.74	17.4	10.26	31.91	17.5	21.87	41.42	17.5	43.80	42.94	17.5	33.69	57.76
18.4	2.10	16.00	18.4	9.96	32.22	18.5	21.82	41.74	18.5	43.74	43.28	18.5	33.69	58.09
19.4	1.96	16.27	19.4	9.59	32.53	19.5	21.79	42.06	19.5	43.66	43.62	19.5	33.69	58.41
20.4	1.85	16.55	20.4	9.18	32.84	20.5	21.77	42.38	20.5	43.58	43.95	20.5	33.72	58.74
21.4	1.74	16.83	21.4	8.75	33.12	21.5	21.76	42.72	21.5	43.47	44.27	21.5	33.76	59.10
22.4	1.63	17.14	22.4	8.29	33.36	22.4	21.75	43.09	22.4	43.36	44.55	22.5	33.80	59.46
23.4	1.50	17.46	23.4	7.85	33.59	23.4	21.73	43.46	23.4	43.25	44.80	23.5	33.84	59.84
24.4	1.37	17.78	24.4	7.42	33.81	24.4	21.70	43.85	24.4	43.16	45.05	24.5	33.86	60.23
25.4	1.23	18.07	25.4	7.04	34.03	25.4	21.66	44.23	25.4	43.08	45.30	25.5	33.87	60.62
26.4	1.06	18.37	26.4	6.66	34.24	26.4	21.60	44.61	26.4	42.99	45.54	26.5	33.86	61.02
27.4	0.89	18.64	27.4	6.32	34.46	27.4	21.52	44.98	27.4	42.92	45.79	27.5	33.82	61.41
28.4	0.71	18.89	28.4	5.99	34.69	28.4	21.44	45.34	28.4	42.84	46.05	28.5	33.77	61.78
29.4	0.53	19.13	29.4	5.64	34.93	29.4	21.34	45.68	29.4	42.77	46.32	29.5	33.71	62.14
30.4	0.35	19.36	30.4	5.27	35.18	30.4	21.24	46.00	30.4	42.69	46.60	30.5	33.64	62.48
31.3	0.18	19.56	31.4	4.86	35.44	31.4	21.14	46.30	31.4	42.59	46.88	31.5	33.58	62.80
9.82	-9.77		31.12	+31.11		10.78	-10.73		9.35	+9.30		12.38	-12.34	
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2233. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Apr. 14 13	-83 17		Apr. 15 3	+87 32		Apr. 15 24	-84 11		Apr. 16 54	+82 10		Apr. 17 16	-80 46	
0.6	41.70	26.36	0.6	57.73	49.51	0.6	12.62	28.96	0.7	26.72	9.09	0.7	4.14	55.89
1.6	41.78	26.73	1.6	58.04	49.75	1.6	12.79	29.26	1.7	26.86	9.22	1.7	4.29	56.06
2.6	41.86	27.09	2.6	58.35	50.02	2.6	12.93	29.57	2.7	27.01	9.37	2.7	4.44	56.21
3.6	41.93	27.43	3.6	58.65	50.29	3.6	13.08	29.85	3.7	27.15	9.52	3.7	4.57	56.35
4.6	42.01	27.77	4.6	58.93	50.59	4.6	13.23	30.14	4.7	27.31	9.69	4.7	4.71	56.49
5.6	42.08	28.07	5.6	59.20	50.90	5.6	13.38	30.40	5.7	27.45	9.88	5.7	4.85	56.64
6.6	42.16	28.38	6.6	59.43	51.21	6.6	13.53	30.64	6.7	27.59	10.11	6.7	4.98	56.74
7.5	42.24	28.70	7.6	59.63	51.54	7.6	13.70	30.90	7.7	27.72	10.35	7.7	5.12	56.84
8.5	42.35	29.01	8.6	59.80	51.86	8.6	13.88	31.16	8.7	27.85	10.59	8.7	5.27	56.95
9.5	42.45	29.33	9.6	59.93	52.17	9.6	14.05	31.43	9.7	27.97	10.82	9.7	5.43	57.07
10.5	42.55	29.69	10.6	60.06	52.47	10.6	14.24	31.71	10.7	28.07	11.06	10.7	5.60	57.19
11.5	42.66	30.06	11.6	60.18	52.75	11.6	14.43	32.02	11.6	28.17	11.29	11.7	5.77	57.32
12.5	42.75	30.45	12.6	60.31	53.02	12.6	14.62	32.34	12.6	28.28	11.49	12.7	5.95	57.49
13.5	42.84	30.85	13.6	60.44	53.28	13.6	14.79	32.68	13.6	28.39	11.68	13.7	6.12	57.68
14.5	42.89	31.26	14.6	60.61	53.54	14.6	14.93	33.03	14.6	28.49	11.87	14.7	6.26	57.88
15.5	42.94	31.65	15.6	60.79	53.80	15.6	15.06	33.38	15.6	28.62	12.05	15.7	6.41	58.09
16.5	42.98	32.01	16.6	60.98	54.08	16.6	15.17	33.71	16.6	28.74	12.25	16.7	6.55	58.30
17.5	43.01	32.35	17.6	61.17	54.39	17.6	15.27	34.03	17.6	28.86	12.47	17.6	6.68	58.51
18.5	43.05	32.69	18.6	61.32	54.71	18.6	15.38	34.32	18.6	28.97	12.73	18.6	6.78	58.70
19.5	43.09	33.00	19.6	61.44	55.06	19.6	15.50	34.59	19.6	29.09	13.00	19.6	6.90	58.85
20.5	43.15	33.31	20.5	61.52	55.41	20.6	15.63	34.87	20.6	29.19	13.30	20.6	7.03	59.00
21.5	43.22	33.64	21.5	61.56	55.76	21.6	15.77	35.15	21.6	29.28	13.61	21.6	7.17	59.14
22.5	43.30	33.97	22.5	61.56	56.10	22.6	15.92	35.43	22.6	29.37	13.92	22.6	7.32	59.30
23.5	43.36	34.34	23.5	61.57	56.41	23.6	16.08	35.75	23.6	29.45	14.21	23.6	7.47	59.46
24.5	43.42	34.71	24.5	61.58	56.73	24.6	16.22	36.08	24.6	29.53	14.50	24.6	7.62	59.65
25.5	43.48	35.10	25.5	61.58	57.01	25.5	16.36	36.42	25.6	29.61	14.76	25.6	7.78	59.87
26.5	43.53	35.48	26.5	61.61	57.30	26.5	16.48	36.79	26.6	29.69	15.02	26.6	7.92	60.09
27.5	43.54	35.86	27.5	61.66	57.57	27.5	16.58	37.14	27.6	29.77	15.26	27.6	8.06	60.33
28.5	43.56	36.24	28.5	61.71	57.86	28.5	16.68	37.49	28.6	29.85	15.50	28.6	8.18	60.58
29.5	43.57	36.61	29.5	61.77	58.17	29.5	16.76	37.84	29.6	29.94	15.76	29.6	8.29	60.81
30.5	43.56	36.95	30.5	61.83	58.48	30.5	16.82	38.18	30.6	30.03	16.02	30.6	8.40	61.05
31.5	43.55	37.28	31.5	61.86	58.80	31.5	16.88	38.51	31.6	30.11	16.30	31.6	8.50	61.29
8.56	-8.50		23.37	+23.35		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m 27 ^s .793			15 ^h 3 ^m 41 ^s .175			15 ^h 23 ^m 56 ^s .594			16 ^h 54 ^m 25 ^s .488			17 ^h 15 ^m 54 ^s .896		
-83° 17' 21''.03			+87° 33' 10''.52			-84° 11' 30''.39			+82° 10' 32''.75			-80° 47' 6''.56		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
Apr. 17 58	+86 36		Apr. 18 6	-87 39		Apr. 19 1	+89 0		Apr. 19 28	-89 13		Apr. 20 48	+82 13	
0.7	54.71	29.25	0.7	38.16	36.38	0.8	50.93	43.34	0.8	26.08	8.64	0.8	32.48	18.05
1.7	55.05	29.29	1.7	38.79	36.47	1.8	52.13	43.29	1.8	27.96	8.58	1.8	32.61	17.88
2.7	55.42	29.34	2.7	39.39	36.54	2.8	53.38	43.27	2.8	29.78	8.52	2.8	32.74	17.71
3.7	55.80	29.42	3.7	39.96	36.60	3.8	54.67	43.26	3.8	31.54	8.46	3.8	32.89	17.56
4.7	56.17	29.51	4.7	40.53	36.66	4.8	56.01	43.26	4.8	33.24	8.40	4.8	33.04	17.41
5.7	56.55	29.60	5.7	41.09	36.72	5.8	57.36	43.27	5.8	34.91	8.32	5.8	33.20	17.26
6.7	56.91	29.74	6.7	41.66	36.77	6.8	58.73	43.31	6.8	36.56	8.24	6.8	33.37	17.15
7.7	57.28	29.89	7.7	42.23	36.79	7.7	60.06	43.37	7.8	38.23	8.15	7.8	33.54	17.06
8.7	57.61	30.06	8.7	42.83	36.81	8.7	61.35	43.45	8.8	39.97	8.05	8.8	33.69	16.99
9.7	57.94	30.23	9.7	43.47	36.85	9.7	62.56	43.54	9.8	41.79	7.95	9.8	33.86	16.93
10.7	58.24	30.40	10.7	44.12	36.90	10.7	63.70	43.63	10.8	43.71	7.85	10.8	34.02	16.89
11.7	58.52	30.55	11.7	44.81	36.98	11.7	64.77	43.71	11.8	45.72	7.77	11.8	34.17	16.85
12.7	58.80	30.71	12.7	45.50	37.06	12.7	65.80	43.79	12.8	47.80	7.72	12.8	34.32	16.81
13.7	59.08	30.83	13.7	46.18	37.19	13.7	66.82	43.85	13.8	49.90	7.71	13.8	34.45	16.76
14.7	59.37	30.94	14.7	46.83	37.33	14.7	67.86	43.89	14.7	51.94	7.69	14.8	34.59	16.67
15.7	59.68	31.05	15.7	47.44	37.48	15.7	68.97	43.92	15.7	53.90	7.69	15.8	34.73	16.58
16.7	60.00	31.18	16.7	48.01	37.63	16.7	70.16	43.97	16.7	55.75	7.72	16.8	34.88	16.48
17.7	60.33	31.33	17.7	48.54	37.76	17.7	71.41	44.03	17.7	57.48	7.74	17.8	35.05	16.40
18.7	60.67	31.51	18.7	49.06	37.89	18.7	72.71	44.11	18.7	59.13	7.74	18.8	35.22	16.34
19.7	61.00	31.71	19.7	49.58	37.99	19.7	74.01	44.22	19.7	60.76	7.72	19.8	35.39	16.31
20.7	61.32	31.94	20.7	50.12	38.07	20.7	75.27	44.36	20.7	62.43	7.68	20.8	35.57	16.31
21.7	61.61	32.19	21.7	50.69	38.15	21.7	76.46	44.53	21.7	64.16	7.63	21.8	35.74	16.32
22.7	61.88	32.43	22.7	51.28	38.24	22.7	77.59	44.71	22.7	65.97	7.59	22.8	35.92	16.36
23.7	62.12	32.66	23.7	51.90	38.35	23.7	78.63	44.89	23.7	67.87	7.57	23.8	36.07	16.39
24.7	62.37	32.89	24.7	52.53	38.47	24.7	79.61	45.03	24.7	69.83	7.56	24.8	36.23	16.43
25.7	62.60	33.11	25.7	53.15	38.61	25.7	80.58	45.17	25.7	71.81	7.57	25.8	36.39	16.46
26.7	62.83	33.31	26.7	53.77	38.78	26.7	81.55	45.31	26.7	73.79	7.61	26.8	36.54	16.47
27.7	63.08	33.49	27.7	54.34	38.96	27.7	82.52	45.42	27.7	75.72	7.67	27.8	36.69	16.48
28.6	63.33	33.69	28.7	54.90	39.15	28.7	83.54	45.53	28.7	77.58	7.73	28.8	36.83	16.48
29.6	63.60	33.88	29.7	55.41	39.34	29.7	84.61	45.66	29.7	79.37	7.80	29.8	36.99	16.47
30.6	63.88	34.10	30.6	55.90	39.54	30.7	85.71	45.79	30.7	81.07	7.87	30.8	37.15	16.47
31.6	64.15	34.32	31.6	56.37	39.73	31.7	86.83	45.93	31.7	82.71	7.94	31.8	37.31	16.50
16.90	+16.87		24.50	-24.48		58.01	+58.00		73.35	-73.34		7.39	+7.32	
17 ^h 59 ^m	1° 307		18 ^h 6 ^m	11° 893		19 ^h 2 ^m	39° 624		19 ^h 27 ^m	42° 218		20 ^h 48 ^m	40° 494	
+86° 36'	51° 17		-87° 39'	51° 82		+89° 1'	2° 17		-89° 13'	28° 57		+82° 13'	29° 86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Apr. 21 38	-83 5		Apr. 22 16	-86 22		Apr. 22 37	-81 48		Apr. 23 27	+86 50		Apr. 23 47	-82 28	
0.9	19.32	46.51	0.9	2.96	66.95	0.9	36.56	43.65	0.9	18.87	62.81	0.9	10.79	33.14
1.9	19.48	46.26	1.9	3.23	66.66	1.9	36.66	43.33	1.9	18.97	62.52	1.9	10.85	32.77
2.9	19.64	46.01	2.9	3.49	66.36	2.9	36.76	43.00	2.9	19.10	62.21	2.9	10.91	32.41
3.9	19.79	45.77	3.9	3.73	66.07	3.9	36.87	42.70	3.9	19.24	61.90	3.9	10.97	32.05
4.9	19.94	45.53	4.9	3.96	65.79	4.9	36.96	42.40	4.9	19.41	61.59	4.9	11.02	31.72
5.9	20.08	45.27	5.9	4.18	65.53	5.9	37.05	42.10	5.9	19.60	61.27	5.9	11.06	31.39
6.9	20.22	45.02	6.9	4.39	65.26	6.9	37.13	41.80	6.9	19.82	60.98	6.9	11.09	31.05
7.9	20.35	44.76	7.9	4.59	64.95	7.9	37.21	41.48	7.9	20.05	60.69	7.9	11.12	30.69
8.9	20.49	44.49	8.9	4.81	64.64	8.9	37.28	41.15	8.9	20.30	60.43	8.9	11.17	30.33
9.9	20.65	44.20	9.9	5.03	64.32	9.9	37.38	40.81	9.9	20.57	60.19	9.9	11.21	29.93
10.9	20.82	43.91	10.9	5.30	63.98	10.9	37.47	40.45	10.9	20.82	59.96	10.9	11.27	29.53
11.8	20.99	43.62	11.9	5.57	63.65	11.9	37.60	40.09	11.9	21.06	59.74	11.9	11.33	29.14
12.8	21.18	43.34	12.9	5.88	63.33	12.9	37.73	39.73	12.9	21.28	59.54	12.9	11.42	28.73
13.8	21.39	43.09	13.9	6.21	63.03	13.9	37.87	39.40	13.9	21.47	59.32	13.9	11.51	28.34
14.8	21.59	42.85	14.9	6.54	62.75	14.9	38.02	39.09	14.9	21.66	59.10	14.9	11.61	27.96
15.8	21.79	42.65	15.9	6.88	62.50	15.9	38.15	38.81	15.9	21.83	58.85	15.9	11.71	27.59
16.8	21.98	42.46	16.9	7.20	62.26	16.9	38.28	38.55	16.9	22.04	58.58	16.9	11.81	27.27
17.8	22.16	42.28	17.9	7.49	62.03	17.9	38.39	38.29	17.9	22.27	58.32	17.9	11.90	26.95
18.8	22.30	42.08	18.9	7.75	61.79	18.9	38.50	38.02	18.9	22.54	58.07	18.9	11.97	26.63
19.8	22.47	41.88	19.9	8.00	61.56	19.9	38.60	37.75	19.9	22.84	57.82	19.9	12.03	26.32
20.8	22.63	41.67	20.8	8.24	61.29	20.9	38.71	37.48	20.9	23.16	57.58	20.9	12.09	25.99
21.8	22.79	41.44	21.8	8.50	61.02	21.9	38.81	37.18	21.9	23.50	57.38	21.9	12.15	25.65
22.8	22.95	41.20	22.8	8.78	60.75	22.9	38.93	36.87	22.9	23.83	57.19	22.9	12.23	25.28
23.8	23.13	40.96	23.8	9.07	60.47	23.9	39.06	36.55	23.9	24.16	57.02	23.9	12.31	24.91
24.8	23.33	40.72	24.8	9.39	60.18	24.9	39.19	36.24	24.9	24.47	56.85	24.9	12.41	24.53
25.8	23.53	40.52	25.8	9.73	59.93	25.8	39.33	35.95	25.9	24.75	56.68	25.9	12.52	24.17
26.8	23.74	40.32	26.8	10.09	59.70	26.8	39.48	35.67	26.9	25.03	56.52	26.9	12.65	23.83
27.8	23.95	40.14	27.8	10.44	59.46	27.8	39.64	35.42	27.9	25.29	56.34	27.9	12.77	23.50
28.8	24.15	39.98	28.8	10.79	59.25	28.8	39.79	35.18	28.9	25.56	56.16	28.9	12.89	23.16
29.8	24.36	39.83	29.8	11.14	59.06	29.8	39.94	34.95	29.9	25.83	55.96	29.9	13.01	22.87
30.8	24.55	39.70	30.8	11.48	58.87	30.8	40.09	34.74	30.9	26.12	55.75	30.9	13.12	22.57
31.8	24.74	39.60	31.8	11.79	58.69	31.8	40.22	34.54	31.9	26.42	55.55	31.9	13.23	22.28
8.32	-8.26		15.86	-15.82		7.02	-6.95		18.20	+18.17		7.64	-7.57	
21 ^h 38 ^m 19 ^s .542			22 ^h 16 ^m 8 ^s .656			22 ^h 37 ^m 39 ^s .016			23 ^h 27 ^m 44 ^s .125			23 ^h 47 ^m 16 ^s .424		
-83° 6' 6".99			-86° 23' 27".13			-81° 49' 2".34			+86° 50' 58".89			-82° 28' 48".42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
May	0 56	+85 48	May	1 29	+88 51	May	1 41	-85 10	May	4 9	+85 20	May	5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.9	56.39	48.51	0.9	22.64	49.34	0.9	46.93	63.44	1.1	57.79	24.38	1.1	12.86	46.18
1.9	56.53	48.22	1.9	23.03	49.02	1.9	46.98	63.10	2.1	57.70	24.09	2.1	12.70	45.94
2.9	56.70	47.94	2.9	23.47	48.70	2.9	47.03	62.76	3.1	57.62	23.77	3.1	12.53	45.68
3.9	56.87	47.65	3.9	23.97	48.39	3.9	47.07	62.44	4.1	57.56	23.43	4.1	12.38	45.40
4.9	57.06	47.38	4.9	24.56	48.10	4.9	47.09	62.12	5.1	57.51	23.09	5.1	12.24	45.12
5.9	57.29	47.13	5.9	25.22	47.80	5.9	47.12	61.79	6.1	57.50	22.75	6.1	12.12	44.80
6.9	57.52	46.89	6.9	25.93	47.52	6.9	47.13	61.43	7.0	57.49	22.42	7.1	12.02	44.51
7.9	57.76	46.68	7.9	26.65	47.28	7.9	47.15	61.07	8.0	57.49	22.10	8.1	11.94	44.21
8.9	58.00	46.49	8.9	27.37	47.04	8.9	47.19	60.66	9.0	57.52	21.80	9.1	11.88	43.93
9.9	58.21	46.31	9.9	28.05	46.83	9.9	47.24	60.27	10.0	57.55	21.52	10.1	11.82	43.69
10.9	58.41	46.14	10.9	28.67	46.64	10.9	47.33	59.88	11.0	57.56	21.26	11.1	11.75	43.45
11.9	58.60	45.96	11.9	29.22	46.42	11.9	47.42	59.48	12.0	57.57	21.00	12.1	11.67	43.21
12.9	58.78	45.77	12.9	29.74	46.20	12.9	47.52	59.10	13.0	57.56	20.74	13.1	11.59	42.98
13.9	58.96	45.58	13.9	30.26	45.97	13.9	47.65	58.75	14.0	57.53	20.46	14.1	11.49	42.75
14.9	59.14	45.35	14.9	30.82	45.70	14.9	47.76	58.43	15.0	57.50	20.15	15.1	11.38	42.48
15.9	59.36	45.12	15.9	31.44	45.44	15.9	47.85	58.12	16.0	57.49	19.83	16.1	11.26	42.20
16.9	59.58	44.89	16.9	32.17	45.17	16.9	47.94	57.83	17.0	57.48	19.50	17.1	11.16	41.88
17.9	59.85	44.68	17.9	32.99	44.90	17.9	48.01	57.52	18.0	57.51	19.15	18.1	11.08	41.54
18.9	60.12	44.49	18.9	33.87	44.65	18.9	48.07	57.21	19.0	57.55	18.82	19.1	11.02	41.20
19.9	60.41	44.31	19.9	34.81	44.43	19.9	48.14	56.88	20.0	57.60	18.49	20.1	10.99	40.85
20.9	60.70	44.16	20.9	35.74	44.25	20.9	48.22	56.55	21.0	57.69	18.16	21.1	10.96	40.53
21.9	60.97	44.01	21.9	36.65	44.07	21.9	48.31	56.20	22.0	57.78	17.88	22.1	10.95	40.24
22.9	61.24	43.89	22.9	37.50	43.89	22.9	48.42	55.85	23.0	57.86	17.59	23.1	10.94	39.95
23.9	61.48	43.77	23.9	38.30	43.73	23.9	48.55	55.50	24.0	57.92	17.32	24.1	10.93	39.67
24.9	61.72	43.64	24.9	39.06	43.56	24.9	48.69	55.15	24.9	57.98	17.06	25.1	10.90	39.40
25.9	61.95	43.50	25.9	39.81	43.39	25.9	48.84	54.82	25.9	58.04	16.78	26.1	10.87	39.14
26.9	62.18	43.37	26.9	40.54	43.22	26.9	49.00	54.50	26.9	58.09	16.51	27.1	10.83	38.87
27.9	62.41	43.22	27.9	41.28	43.03	27.9	49.15	54.21	27.9	58.13	16.23	28.1	10.78	38.60
28.9	62.65	43.07	28.9	42.06	42.83	28.9	49.30	53.92	28.9	58.18	15.95	29.0	10.74	38.32
29.9	62.91	42.91	29.9	42.89	42.64	29.9	49.46	53.64	29.9	58.22	15.64	30.0	10.69	38.02
30.8	63.18	42.75	30.9	43.79	42.44	30.9	49.60	53.37	30.9	58.28	15.33	31.0	10.65	37.69
31.8	63.46	42.60	31.9	44.75	42.23	31.9	49.73	53.13	31.9	58.36	15.00	32.0	10.63	37.35
13.69	+13.66		50.38	+50.37		11.91	-11.87		12.31	+12.27		11.86	+11.81	
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m ° ' "		May	h m ° ' "		May	h m ° ' "		May	h m ° ' "		May	h m ° ' "	
	5 45 -84 49			6 46 -80 43			7 2 +87 11			7 13 +82 34			7 15 -86 54	
	s "			s "			s "			s "			s "	
1.1	56.86 57.46		1.2	50.98 55.74		1.2	11.29 10.61		1.2	46.66 45.14		1.2	56.36 26.66	
2.1	56.67 57.24		2.2	50.81 55.58		2.2	10.89 10.46		2.2	46.51 45.01		2.2	55.97 26.56	
3.1	56.48 57.04		3.2	50.68 55.44		3.2	10.48 10.28		3.2	46.35 44.86		3.2	55.58 26.48	
4.1	56.29 56.84		4.2	50.56 55.32		4.2	10.09 10.08		4.2	46.20 44.70		4.2	55.19 26.40	
5.1	56.10 56.65		5.2	50.44 55.22		5.2	9.71 9.86		5.2	46.06 44.51		5.2	54.81 26.34	
6.1	55.90 56.48		6.2	50.32 55.11		6.2	9.37 9.63		6.2	45.91 44.31		6.2	54.41 26.28	
7.1	55.70 56.31		7.2	50.20 55.00		7.2	9.04 9.41		7.2	45.80 44.10		7.2	54.00 26.22	
8.1	55.47 56.10		8.2	50.06 54.88		8.2	8.76 9.19		8.2	45.69 43.89		8.2	53.57 26.15	
9.1	55.25 55.87		9.2	49.93 54.75		9.2	8.51 8.98		9.2	45.59 43.69		9.2	53.12 26.07	
10.1	55.03 55.63		10.1	49.79 54.59		10.2	8.28 8.77		10.2	45.50 43.50		10.2	52.66 25.95	
11.1	54.83 55.35		11.1	49.66 54.39		11.2	8.04 8.57		11.2	45.42 43.33		11.2	52.20 25.82	
12.1	54.63 55.06		12.1	49.53 54.16		12.2	7.79 8.40		12.2	45.33 43.18		12.2	51.76 25.66	
13.1	54.45 54.77		13.1	49.41 53.93		13.2	7.52 8.23		13.2	45.23 43.03		13.2	51.34 25.48	
14.1	54.28 54.48		14.1	49.29 53.71		14.1	7.22 8.04		14.2	45.12 42.86		14.2	50.96 25.30	
15.1	54.13 54.20		15.1	49.18 53.50		15.1	6.90 7.84		15.2	45.00 42.69		15.2	50.59 25.14	
16.1	53.98 53.95		16.1	49.08 53.30		16.1	6.58 7.62		16.2	44.87 42.49		16.2	50.25 25.00	
17.1	53.83 53.73		17.1	48.97 53.12		17.1	6.24 7.38		17.1	44.73 42.26		17.2	49.92 24.87	
18.1	53.69 53.49		18.1	48.87 52.97		18.1	5.94 7.11		18.1	44.62 42.01		18.1	49.58 24.75	
19.1	53.52 53.27		19.1	48.77 52.81		19.1	5.67 6.82		19.1	44.51 41.74		19.1	49.22 24.63	
20.1	53.35 53.05		20.1	48.66 52.64		20.1	5.43 6.52		20.1	44.41 41.47		20.1	48.85 24.51	
21.1	53.18 52.81		21.1	48.55 52.46		21.1	5.22 6.23		21.1	44.34 41.21		21.1	48.47 24.38	
22.1	53.00 52.55		22.1	48.44 52.26		22.1	5.03 5.96		22.1	44.27 40.96		22.1	48.07 24.25	
23.1	52.84 52.26		23.1	48.33 52.04		23.1	4.85 5.70		23.1	44.20 40.72		23.1	47.68 24.07	
24.1	52.69 51.95		24.1	48.22 51.80		24.1	4.69 5.45		24.1	44.14 40.50		24.1	47.29 23.87	
25.1	52.54 51.63		25.1	48.11 51.55		25.1	4.50 5.21		25.1	44.07 40.29		25.1	46.91 23.67	
26.1	52.40 51.32		26.1	48.01 51.28		26.1	4.30 4.97		26.1	43.99 40.07		26.1	46.56 23.45	
27.1	52.28 50.99		27.1	47.91 51.01		27.1	4.09 4.75		27.1	43.91 39.86		27.1	46.22 23.22	
28.1	52.17 50.68		28.1	47.82 50.73		28.1	3.87 4.51		28.1	43.82 39.63		28.1	45.89 22.99	
29.1	52.07 50.36		29.1	47.73 50.46		29.1	3.64 4.27		29.1	43.73 39.41		29.1	45.60 22.76	
30.1	51.98 50.06		30.1	47.65 50.21		30.1	3.41 4.01		30.1	43.64 39.16		30.1	45.32 22.56	
31.0	51.88 49.78		31.1	47.57 49.99		31.1	3.17 3.73		31.1	43.55 38.89		31.1	45.04 22.36	
32.0	51.78 49.52		32.1	47.50 49.76		32.1	2.96 3.42		32.1	43.46 38.61		32.1	44.76 22.18	
11.10	-11.06		6.21	-6.13		20.37	+20.34		7.74	+7.68		18.53	-18.51	
5 ^h 46 ^m 14 ^s .756			6 ^h 46 ^m 58 ^s .546			7 ^h 2 ^m 4 ^s .048			7 ^h 13 ^m 42 ^s .294		7 ^h 16 ^m 20 ^s .292			
-84° 49' 46".89			-80° 43' 38".16			+87° 10' 54".74			+82° 34' 30".13		-86° 54' 6".70			

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "
	8 15	+88 53		9 8	-85 20		9 25	+81 41		9 36	-80 34		10 21	+82 59
	s	"		s	"		s	"		s	"		s	"
1.2	80.60	14.29	1.3	52.32	25.10	1.3	29.47	51.29	1.3	21.95	35.67	1.3	14.86	0.69
2.2	79.48	14.24	2.3	52.05	25.16	2.3	29.32	51.35	2.3	21.82	35.77	2.3	14.69	0.84
3.2	78.34	14.16	3.3	51.80	25.23	3.3	29.16	51.39	3.3	21.70	35.86	3.3	14.52	0.96
4.2	77.18	14.08	4.3	51.54	25.31	4.3	29.01	51.40	4.3	21.59	35.97	4.3	14.34	1.07
5.2	76.04	13.97	5.3	51.30	25.40	5.3	28.85	51.41	5.3	21.47	36.09	5.3	14.16	1.15
6.2	74.93	13.84	6.3	51.05	25.49	6.3	28.69	51.38	6.3	21.35	36.21	6.3	13.97	1.20
7.2	73.89	13.69	7.3	50.79	25.60	7.3	28.55	51.34	7.3	21.23	36.36	7.3	13.80	1.26
8.2	72.94	13.54	8.3	50.52	25.72	8.3	28.41	51.29	8.3	21.11	36.50	8.3	13.64	1.26
9.2	72.05	13.39	9.3	50.23	25.82	9.3	28.29	51.23	9.3	20.99	36.64	9.3	13.49	1.28
10.2	71.25	13.25	10.2	49.92	25.89	10.3	28.19	51.18	10.3	20.86	36.76	10.3	13.35	1.30
11.2	70.45	13.12	11.2	49.61	25.94	11.3	28.08	51.14	11.3	20.72	36.85	11.3	13.22	1.33
12.2	69.64	13.01	12.2	49.30	25.96	12.3	27.98	51.10	12.3	20.57	36.91	12.3	13.09	1.37
13.2	68.78	12.91	13.2	49.00	25.96	13.3	27.85	51.10	13.3	20.42	36.96	13.3	12.96	1.41
14.2	67.86	12.81	14.2	48.71	25.96	14.3	27.73	51.09	14.3	20.28	36.99	14.3	12.81	1.47
15.2	66.86	12.69	15.2	48.43	25.95	15.2	27.59	51.08	15.3	20.15	37.01	15.3	12.63	1.55
16.2	65.81	12.56	16.2	48.17	25.95	16.2	27.43	51.06	16.3	20.02	37.03	16.3	12.46	1.60
17.2	64.74	12.39	17.2	47.93	25.95	17.2	27.28	51.01	17.2	19.90	37.06	17.3	12.27	1.65
18.2	63.70	12.20	18.2	47.69	25.98	18.2	27.13	50.93	18.2	19.78	37.10	18.3	12.08	1.64
19.2	62.72	11.98	19.2	47.45	26.01	19.2	26.98	50.84	19.2	19.67	37.18	19.3	11.89	1.62
20.2	61.81	11.76	20.2	47.19	26.05	20.2	26.84	50.73	20.2	19.55	37.26	20.3	11.71	1.59
21.2	60.98	11.54	21.2	46.92	26.09	21.2	26.71	50.60	21.2	19.44	37.33	21.3	11.56	1.54
22.2	60.22	11.31	22.2	46.64	26.12	22.2	26.61	50.48	22.2	19.31	37.39	22.3	11.41	1.49
23.2	59.48	11.12	23.2	46.36	26.13	23.2	26.50	50.37	23.2	19.18	37.43	23.3	11.26	1.44
24.2	58.79	10.92	24.2	46.07	26.10	24.2	26.39	50.27	24.2	19.04	37.43	24.3	11.12	1.40
25.2	58.06	10.74	25.2	45.78	26.07	25.2	26.29	50.18	25.2	18.91	37.42	25.3	10.99	1.37
26.2	57.32	10.57	26.2	45.48	26.02	26.2	26.17	50.10	26.2	18.76	37.39	26.3	10.85	1.35
27.2	56.55	10.40	27.2	45.21	25.95	27.2	26.05	50.02	27.2	18.62	37.36	27.3	10.70	1.33
28.2	55.73	10.22	28.2	44.93	25.87	28.2	25.92	49.95	28.2	18.49	37.33	28.2	10.54	1.32
29.2	54.89	10.04	29.2	44.68	25.79	29.2	25.79	49.86	29.2	18.36	37.28	29.2	10.37	1.30
30.2	54.02	9.85	30.2	44.44	25.71	30.2	25.66	49.76	30.2	18.24	37.22	30.2	10.19	1.27
31.2	53.14	9.64	31.2	44.20	25.64	31.2	25.52	49.64	31.2	18.13	37.17	31.2	10.02	1.23
32.2	52.28	9.38	32.2	43.97	25.58	32.2	25.39	49.50	32.2	18.02	37.13	32.2	9.84	1.17
51.48	+51.47		12.31	-12.27		6.93	+6.85		6.11	-6.03		8.19	+8.13	
8 ^h 15 ^m 48 ^s .380			9 ^h 8 ^m 57 ^s .938			9 ^h 25 ^m 21 ^s .719			9 ^h 36 ^m 22 ^s .347			10 ^h 21 ^m 4 ^s .831		
+88° 53' 0".29			-85° 19' 57".45			+81° 41' 41".50			-80° 34' 6".83			+82° 58' 54".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
May 10 59	-84 9		May 12 14	+88 9		May 12 46	-84 40		May 12 48	+83 51		May 13 27	-85 22	
1.3	60.18	19.56	1.4	64.86	35.44	1.4	21.14	46.30	1.4	42.59	46.88	1.5	33.58	2.80
2.3	60.02	19.76	2.4	64.42	35.63	2.4	21.06	46.59	2.4	42.48	47.18	2.4	33.53	3.12
3.3	59.87	19.96	3.4	63.95	35.95	3.4	20.97	46.88	3.4	42.37	47.47	3.4	33.48	3.43
4.3	59.71	20.18	4.4	63.43	36.19	4.4	20.90	47.17	4.4	42.24	47.77	4.4	33.43	3.73
5.3	59.57	20.40	5.4	62.87	36.42	5.4	20.83	47.49	5.4	42.10	48.04	5.4	33.39	4.05
6.3	59.43	20.65	6.4	62.29	36.61	6.4	20.77	47.81	6.4	41.95	48.28	6.4	33.38	4.37
7.3	59.28	20.88	7.4	61.71	36.80	7.4	20.71	48.13	7.4	41.81	48.51	7.4	33.36	4.71
8.3	59.13	21.13	8.4	61.15	36.98	8.4	20.65	48.47	8.4	41.67	48.72	8.4	33.33	5.08
9.3	58.96	21.38	9.4	60.61	37.13	9.4	20.57	48.82	9.4	41.53	48.91	9.4	33.30	5.45
10.3	58.78	21.64	10.4	60.13	37.26	10.4	20.47	49.18	10.4	41.41	49.09	10.4	33.24	5.83
11.3	58.59	21.87	11.4	59.67	37.40	11.4	20.35	49.53	11.4	41.30	49.27	11.4	33.16	6.20
12.3	58.38	22.07	12.4	59.24	37.57	12.4	20.21	49.86	12.4	41.19	49.46	12.4	33.06	6.55
13.3	58.18	22.26	13.4	58.79	37.76	13.4	20.07	50.15	13.4	41.08	49.68	13.4	32.93	6.87
14.3	57.97	22.41	14.4	58.33	37.95	14.4	19.93	50.43	14.4	40.96	49.91	14.4	32.81	7.17
15.3	57.78	22.55	15.4	57.82	38.14	15.4	19.79	50.70	15.4	40.83	50.15	15.4	32.70	7.46
16.3	57.59	22.69	16.4	57.23	38.33	16.4	19.66	50.94	16.4	40.68	50.39	16.4	32.59	7.74
17.3	57.43	22.83	17.4	56.62	38.53	17.4	19.56	51.19	17.4	40.50	50.63	17.4	32.50	8.00
18.3	57.28	22.98	18.4	55.96	38.71	18.4	19.46	51.45	18.4	40.33	50.84	18.4	32.43	8.28
19.3	57.12	23.15	19.4	55.28	38.85	19.4	19.36	51.72	19.4	40.15	51.03	19.4	32.37	8.58
20.3	56.95	23.34	20.3	54.61	38.96	20.4	19.27	52.00	20.4	39.98	51.20	20.4	32.31	8.91
21.3	56.78	23.53	21.3	53.96	39.07	21.4	19.17	52.29	21.4	39.80	51.35	21.4	32.23	9.24
22.3	56.60	23.71	22.3	53.35	39.17	22.4	19.05	52.59	22.4	39.64	51.49	22.4	32.14	9.58
23.3	56.40	23.88	23.3	52.78	39.25	23.4	18.92	52.88	23.4	39.49	51.63	23.4	32.03	9.90
24.3	56.20	24.03	24.3	52.23	39.33	24.4	18.77	53.17	24.4	39.34	51.77	24.4	31.90	10.23
25.3	55.98	24.17	25.3	51.70	39.43	25.4	18.60	53.44	25.4	39.20	51.91	25.4	31.76	10.54
26.3	55.76	24.29	26.3	51.16	39.53	26.4	18.43	53.68	26.4	39.06	52.07	26.4	31.61	10.83
27.3	55.56	24.38	27.3	50.61	39.64	27.4	18.25	53.91	27.4	38.91	52.23	27.4	31.45	11.09
28.3	55.36	24.47	28.3	50.05	39.75	28.3	18.07	54.13	28.4	38.75	52.39	28.4	31.27	11.35
29.3	55.16	24.53	29.3	49.45	39.87	29.3	17.90	54.33	29.3	38.58	52.56	29.4	31.11	11.60
30.3	54.95	24.59	30.3	48.81	39.98	30.3	17.75	54.53	30.3	38.41	52.74	30.4	30.96	11.83
31.3	54.77	24.65	31.3	48.13	40.10	31.3	17.60	54.72	31.3	38.23	52.92	31.4	30.81	12.05
32.3	54.59	24.73	32.3	47.44	40.21	32.3	17.45	54.91	32.3	38.04	53.08	32.4	30.68	12.27
9.82	-9.77		31.15	+31.14		10.79	-10.74		9.36	+9.30		12.38	-12.34	
10 ^h 59 ^m	55°.280		12 ^h 14 ^m	28°.425		12 ^h 46 ^m	7°.152		12 ^h 48 ^m	30°.418		13 ^h 27 ^m	14°.624	
-84° 8'	50".60		+88° 9'	36".08		-84° 40'	22".34		+83° 51'	50".47		-85° 21'	42".23	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
May 14 13	-83 17		May 15 3	+87 32		May 15 24	-84 11		May 16 54	+82 10		May 17 16	-80 47	
1.5 43.55	37.28		1.5 61.86	58.80		1.5 16.88	38.51		1.6 30.11	16.30		1.6 8.50	1.29	
2.5 43.55	37.60		2.5 61.88	59.14		2.5 16.95	38.82		2.6 30.21	16.61		2.6 8.60	1.52	
3.5 43.56	37.91		3.5 61.89	59.48		3.5 17.02	39.11		3.6 30.29	16.93		3.6 8.70	1.72	
4.5 43.56	38.21		4.5 61.85	59.83		4.5 17.10	39.41		4.6 30.34	17.26		4.6 8.80	1.92	
5.5 43.59	38.53		5.5 61.77	60.19		5.5 17.18	39.70		5.6 30.41	17.60		5.6 8.91	2.11	
6.5 43.62	38.85		6.5 61.67	60.54		6.5 17.28	39.99		6.6 30.47	17.94		6.6 9.03	2.30	
7.5 43.64	39.18		7.5 61.55	60.87		7.5 17.38	40.31		7.6 30.52	18.28		7.6 9.17	2.52	
8.5 43.67	39.54		8.5 61.41	61.17		8.5 17.49	40.63		8.6 30.56	18.61		8.6 9.30	2.74	
9.5 43.70	39.92		9.5 61.28	61.46		9.5 17.59	40.98		9.6 30.60	18.90		9.6 9.43	2.98	
10.5 43.71	40.29		10.5 61.17	61.73		10.5 17.68	41.35		10.6 30.64	19.19		10.6 9.56	3.25	
11.5 43.70	40.67		11.5 61.07	61.99		11.5 17.74	41.73		11.6 30.68	19.47		11.6 9.68	3.52	
12.5 43.67	41.04		12.5 60.99	62.27		12.5 17.79	42.10		12.6 30.72	19.75		12.6 9.78	3.82	
13.5 43.63	41.40		13.5 60.93	62.54		13.5 17.83	42.46		13.6 30.77	20.02		13.6 9.87	4.12	
14.4 43.59	41.73		14.5 60.86	62.85		14.5 17.84	42.81		14.6 30.82	20.30		14.6 9.96	4.41	
15.4 43.55	42.05		15.5 60.77	63.17		15.5 17.86	43.14		15.6 30.88	20.62		15.6 10.03	4.67	
16.4 43.51	42.33		16.5 60.65	63.50		16.5 17.89	43.43		16.6 30.92	20.97		16.6 10.11	4.91	
17.4 43.48	42.61		17.5 60.49	63.83		17.5 17.92	43.72		17.6 30.96	21.32		17.6 10.18	5.13	
18.4 43.47	42.90		18.5 60.31	64.18		18.5 17.96	44.01		18.5 30.99	21.69		18.6 10.27	5.36	
19.4 43.46	43.20		19.5 60.08	64.50		19.5 18.01	44.31		19.5 31.00	22.07		19.6 10.36	5.57	
20.4 43.46	43.52		20.5 59.83	64.81		20.5 18.07	44.62		20.5 31.01	22.42		20.6 10.47	5.80	
21.4 43.45	43.85		21.5 59.58	65.10		21.5 18.13	44.95		21.5 31.01	22.76		21.6 10.58	6.05	
22.4 43.43	44.20		22.5 59.34	65.38		22.5 18.19	45.30		22.5 31.02	23.09		22.6 10.68	6.31	
23.4 43.40	44.54		23.5 59.11	65.64		23.5 18.23	45.66		23.5 31.02	23.40		23.5 10.78	6.60	
24.4 43.35	44.89		24.5 58.90	65.88		24.5 18.24	46.03		24.5 31.03	23.70		24.5 10.87	6.92	
25.4 43.30	45.23		25.5 58.71	66.14		25.5 18.25	46.39		25.5 31.04	24.00		25.5 10.95	7.23	
26.4 43.23	45.56		26.4 58.52	66.41		26.5 18.24	46.73		26.5 31.06	24.29		26.5 11.02	7.54	
27.4 43.15	45.86		27.4 58.35	66.67		27.5 18.21	47.08		27.5 31.07	24.59		27.5 11.07	7.84	
28.4 43.07	46.14		28.4 58.15	66.94		28.5 18.18	47.41		28.5 31.08	24.91		28.5 11.12	8.13	
29.4 42.99	46.41		29.4 57.93	67.22		29.5 18.15	47.71		29.5 31.09	25.24		29.5 11.17	8.42	
30.4 42.91	46.67		30.4 57.71	67.51		30.5 18.14	47.99		30.5 31.10	25.58		30.5 11.22	8.68	
31.4 42.85	46.91		31.4 57.44	67.82		31.4 18.12	48.26		31.5 31.10	25.94		31.5 11.26	8.94	
32.4 42.80	47.16		32.4 57.14	68.13		32.4 18.11	48.54		32.5 31.10	26.31		32.5 11.32	9.18	
8.56	-8.51		23.40	+23.38		9.89	-9.84		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m 27 ^s .793			15 ^h 3 ^m 41 ^s .175			15 ^h 23 ^m 56 ^s .594			16 ^h 54 ^m 25 ^s .488			17 ^h 15 ^m 54 ^s .896		
-83° 17' 21".03			+87° 33' 10".52			-84° 11' 30".39			+82° 10' 32".75			-80° 47' 6".56		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "
May	17 59	+86 36	May	18 6	-87 39	May	19 2	+89 0	May	19 29	-89 13	May	20 48	+82 13
1.6	4.15	34.32	1.6	56.37	39.73	1.7	26.83	45.93	1.7	22.71	7.94	1.8	37.31	16.50
2.6	4.42	34.55	2.6	56.84	39.91	2.7	27.98	46.10	2.7	24.30	8.01	2.8	37.48	16.53
3.6	4.69	34.81	3.6	57.29	40.07	3.7	29.12	46.28	3.7	25.84	8.08	3.8	37.66	16.57
4.6	4.94	35.08	4.6	57.75	40.22	4.7	30.24	46.47	4.7	27.41	8.11	4.7	37.83	16.62
5.6	5.18	35.37	5.6	58.22	40.36	5.7	31.30	46.71	5.7	28.99	8.14	5.7	38.01	16.72
6.6	5.39	35.68	6.6	58.72	40.50	6.7	32.30	46.95	6.7	30.65	8.18	6.7	38.18	16.84
7.6	5.58	35.97	7.6	59.26	40.66	7.7	33.21	47.19	7.7	32.39	8.22	7.7	38.35	16.97
8.6	5.76	36.27	8.6	59.81	40.83	8.7	34.03	47.42	8.7	34.23	8.27	8.7	38.50	17.10
9.6	5.91	36.54	9.6	60.38	41.02	9.7	34.79	47.66	9.7	36.14	8.33	9.7	38.65	17.23
10.6	6.06	36.79	10.6	60.94	41.25	10.7	35.52	47.85	10.7	38.05	8.42	10.7	38.80	17.34
11.6	6.21	37.03	11.6	61.47	41.50	11.7	36.25	48.04	11.7	39.94	8.55	11.7	38.93	17.44
12.6	6.39	37.27	12.6	61.97	41.77	12.7	37.02	48.23	12.7	41.75	8.68	12.7	39.07	17.53
13.6	6.58	37.50	13.6	62.41	42.02	13.7	37.85	48.40	13.7	43.43	8.83	13.7	39.22	17.61
14.6	6.77	37.75	14.6	62.81	42.26	14.8	38.76	48.59	14.7	44.99	8.98	14.7	39.36	17.69
15.6	6.97	38.02	15.6	63.19	42.50	15.6	39.70	48.82	15.7	46.45	9.12	15.7	39.51	17.78
16.6	7.17	38.32	16.6	63.56	42.71	16.6	40.66	49.05	16.7	47.84	9.24	16.7	39.69	17.90
17.6	7.36	38.65	17.6	63.93	42.91	17.6	41.60	49.32	17.7	49.22	9.34	17.7	39.86	18.05
18.6	7.52	38.98	18.6	64.34	43.10	18.6	42.47	49.61	18.7	50.65	9.42	18.7	40.03	18.23
19.6	7.66	39.33	19.6	64.76	43.28	19.6	43.25	49.91	19.7	52.17	9.51	19.7	40.18	18.41
20.6	7.76	39.67	20.6	65.21	43.47	20.6	43.93	50.21	20.7	53.77	9.60	20.7	40.33	18.61
21.6	7.86	40.00	21.6	65.68	43.69	21.6	44.55	50.50	21.6	55.43	9.72	21.7	40.48	18.82
22.6	7.95	40.32	22.6	66.15	43.92	22.6	45.12	50.78	22.6	57.12	9.85	22.7	40.62	19.01
23.6	8.04	40.60	23.6	66.59	44.19	23.6	45.67	51.03	23.6	58.81	9.98	23.7	40.75	19.19
24.6	8.13	40.89	24.6	67.01	44.45	24.6	46.23	51.28	24.6	60.44	10.15	24.7	40.88	19.37
25.6	8.23	41.16	25.6	67.40	44.73	25.6	46.82	51.51	25.6	62.00	10.34	25.7	41.02	19.52
26.6	8.33	41.43	26.6	67.76	45.01	26.6	47.43	51.74	26.6	63.49	10.54	26.7	41.15	19.68
27.6	8.44	41.72	27.6	68.08	45.30	27.6	48.07	51.99	27.6	64.88	10.74	27.7	41.28	19.82
28.6	8.55	42.02	28.6	68.37	45.58	28.6	48.75	52.26	28.6	66.19	10.95	28.7	41.41	19.99
29.6	8.66	42.32	29.6	68.66	45.86	29.6	49.44	52.52	29.6	67.43	11.14	29.7	41.55	20.16
30.6	8.78	42.64	30.6	68.93	46.11	30.6	50.14	52.80	30.6	68.63	11.32	30.7	41.69	20.35
31.6	8.88	42.99	31.6	69.20	46.35	31.6	50.80	53.11	31.6	69.80	11.50	31.7	41.84	20.58
32.6	8.97	43.35	32.6	69.48	46.59	32.6	51.42	53.43	32.6	71.00	11.65	32.7	41.99	20.81
16.91	+16.88		24.51	-24.49		58.09	+58.08		73.38	-73.38		7.39	+7.32	
17 ^h 59 ^m	1° 30'		18 ^h 6 ^m	11° 89'		19 ^h 2 ^m	39° 62'		19 ^h 27 ^m	42° 21'		20 ^h 48 ^m	40° 49'	
+86° 36'	51'' 17		-87° 39'	51'' 82		+89° 1'	2'' 17		-89° 13'	28'' 57		+82° 13'	29'' 86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "	May	h m	° ' "
	21 38	-83 5		22 16	-86 22		22 37	-81 48		23 27	+86 50		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.8	24.74	39.60	1.8	11.79	58.69	1.8	40.22	34.54	1.9	26.42	55.55	1.9	13.23	22.28
2.8	24.91	39.46	2.8	12.11	58.51	2.8	40.35	34.35	2.9	26.75	55.35	2.9	13.33	22.01
3.8	25.08	39.33	3.8	12.40	58.34	3.8	40.48	34.13	3.9	27.12	55.15	3.9	13.43	21.74
4.8	25.25	39.18	4.8	12.69	58.15	4.8	40.59	33.91	4.9	27.48	54.98	4.9	13.53	21.47
5.8	25.42	39.04	5.8	12.98	57.97	5.8	40.71	33.70	5.9	27.86	54.84	5.9	13.63	21.18
6.8	25.60	38.88	6.8	13.27	57.74	6.8	40.84	33.46	6.9	28.27	54.69	6.9	13.73	20.87
7.8	25.78	38.71	7.8	13.59	57.53	7.8	40.97	33.22	7.9	28.66	54.59	7.9	13.83	20.56
8.8	25.99	38.55	8.8	13.94	57.31	8.8	41.13	32.98	8.8	29.04	54.49	8.9	13.95	20.25
9.8	26.20	38.40	9.8	14.30	57.11	9.8	41.30	32.73	9.8	29.39	54.42	9.9	14.08	19.91
10.8	26.43	38.27	10.8	14.69	56.91	10.8	41.47	32.49	10.8	29.72	54.34	10.9	14.23	19.59
11.8	26.65	38.15	11.8	15.11	56.75	11.8	41.65	32.29	11.8	30.04	54.26	11.9	14.38	19.29
12.8	26.88	38.06	12.8	15.49	56.61	12.8	41.82	32.11	12.8	30.34	54.16	12.9	14.54	19.00
13.8	27.09	38.00	13.8	15.88	56.50	13.8	41.99	31.96	13.8	30.65	54.03	13.8	14.69	18.76
14.8	27.28	37.95	14.8	16.24	56.39	14.8	42.14	31.82	14.8	30.98	53.91	14.8	14.83	18.53
15.8	27.47	37.90	15.8	16.57	56.28	15.8	42.28	31.68	15.8	31.35	53.77	15.8	14.97	18.31
16.8	27.65	37.82	16.8	16.88	56.17	16.8	42.42	31.53	16.8	31.74	53.65	16.8	15.10	18.09
17.7	27.82	37.74	17.8	17.18	56.06	17.8	42.55	31.37	17.8	32.16	53.55	17.8	15.20	17.87
18.7	27.99	37.65	18.8	17.49	55.93	18.8	42.68	31.20	18.8	32.59	53.47	18.8	15.32	17.64
19.7	28.18	37.55	19.8	17.80	55.78	19.8	42.81	31.03	19.8	33.03	53.42	19.8	15.44	17.37
20.7	28.36	37.44	20.8	18.13	55.64	20.8	42.97	30.85	20.8	33.46	53.39	20.8	15.57	17.11
21.7	28.57	37.34	21.8	18.50	55.49	21.8	43.14	30.66	21.8	33.86	53.37	21.8	15.70	16.84
22.7	28.79	37.25	22.8	18.87	55.35	22.8	43.31	30.47	22.8	34.24	53.36	22.8	15.85	16.57
23.7	28.99	37.19	23.8	19.26	55.24	23.8	43.48	30.31	23.8	34.61	53.35	23.8	16.02	16.32
24.7	29.22	37.14	24.8	19.66	55.14	24.8	43.66	30.17	24.8	34.96	53.31	24.8	16.19	16.09
25.7	29.44	37.12	25.8	20.05	55.05	25.8	43.83	30.05	25.8	35.30	53.28	25.8	16.35	15.86
26.7	29.64	37.11	26.7	20.43	55.01	26.8	44.01	29.95	26.8	35.66	53.24	26.8	16.52	15.66
27.7	29.84	37.12	27.7	20.81	54.98	27.8	44.17	29.87	27.8	36.01	53.19	27.8	16.68	15.47
28.7	30.03	37.14	28.7	21.17	54.94	28.8	44.33	29.80	28.8	36.37	53.14	28.8	16.84	15.29
29.7	30.22	37.15	29.7	21.51	54.91	29.8	44.48	29.73	29.8	36.76	53.10	29.8	16.98	15.14
30.7	30.39	37.15	30.7	21.83	54.87	30.8	44.62	29.66	30.8	37.17	53.06	30.8	17.12	14.99
31.7	30.56	37.16	31.7	22.15	54.82	31.8	44.77	29.57	31.8	37.60	53.04	31.8	17.26	14.82
32.7	30.73	37.15	32.7	22.45	54.78	32.7	44.91	29.49	32.8	38.05	53.04	32.8	17.39	14.66
8.32	-8.26		15.85	-15.82		7.02	-6.95		18.19	+18.16		7.63	-7.57	
21 ^h 38 ^m 19 ^s .542			22 ^h 16 ^m 8 ^s .656			22 ^h 37 ^m 39 ^s .016			23 ^h 27 ^m 44 ^s .125			23 ^h 47 ^m 16 ^s .424		
-83° 6' 6".99			-86° 23' 27".13			-81° 49' 2".34			+86° 50' 58".89			-82° 28' 48".42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m 0 57	° ' +85 48	June	h m 1 29	° ' +88 51	June	h m 1 41	° ' -85 10	June	h m 4 9	° ' +85 20	June	h m 5 35	° ' +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.8	3.46	42.60	0.9	44.75	42.23	0.9	49.73	53.13	0.9	58.36	15.00	1.0	10.63	37.35
1.8	3.77	42.47	1.9	45.76	42.03	1.9	49.86	52.86	1.9	58.46	14.67	2.0	10.62	37.01
2.8	4.08	42.35	2.9	46.84	41.87	2.9	49.98	52.59	2.9	58.58	14.34	3.0	10.63	36.64
3.8	4.41	42.25	3.9	47.95	41.72	3.9	50.10	52.32	3.9	58.72	14.05	4.0	10.67	36.29
4.8	4.73	42.18	4.9	49.04	41.60	4.9	50.22	52.01	4.9	58.87	13.76	5.0	10.73	35.97
5.8	5.05	42.13	5.9	50.10	41.50	5.9	50.36	51.70	5.9	59.04	13.51	6.0	10.79	35.68
6.8	5.34	42.10	6.9	51.11	41.42	6.9	50.54	51.38	6.9	59.19	13.27	7.0	10.86	35.39
7.8	5.61	42.06	7.9	52.05	41.35	7.9	50.72	51.06	7.9	59.34	13.03	8.0	10.92	35.14
8.8	5.88	42.02	8.8	52.93	41.25	8.9	50.92	50.76	8.9	59.47	12.81	9.0	10.98	34.88
9.8	6.12	41.97	9.8	53.78	41.15	9.9	51.12	50.48	9.9	59.57	12.58	10.0	11.00	34.61
10.8	6.39	41.87	10.8	54.65	41.03	10.9	51.33	50.23	10.9	59.68	12.33	11.0	11.01	34.34
11.8	6.65	41.78	11.8	55.57	40.89	11.8	51.54	49.99	11.9	59.78	12.05	12.0	11.02	34.03
12.8	6.94	41.69	12.8	56.58	40.75	12.8	51.72	49.79	12.9	59.90	11.76	13.0	11.05	33.71
13.8	7.26	41.63	13.8	57.67	40.61	13.8	51.89	49.59	13.9	60.03	11.44	14.0	11.09	33.36
14.8	7.60	41.56	14.8	58.84	40.48	14.8	52.04	49.37	14.9	60.20	11.15	15.0	11.14	33.02
15.8	7.94	41.51	15.8	60.05	40.38	15.8	52.19	49.15	15.9	60.38	10.86	15.9	11.22	32.68
16.8	8.30	41.49	16.8	61.27	40.31	16.8	52.36	48.93	16.9	60.57	10.58	16.9	11.31	32.33
17.8	8.63	41.49	17.8	62.46	40.25	17.8	52.53	48.68	17.9	60.78	10.34	17.9	11.42	32.01
18.8	8.96	41.51	18.8	63.60	40.21	18.8	52.71	48.44	18.9	60.99	10.09	18.9	11.54	31.71
19.8	9.28	41.53	19.8	64.70	40.18	19.8	52.91	48.18	19.9	61.19	9.88	19.9	11.65	31.43
20.8	9.56	41.55	20.8	65.73	40.16	20.8	53.14	47.94	20.9	61.38	9.68	20.9	11.76	31.16
21.8	9.85	41.56	21.8	66.72	40.12	21.8	53.37	47.71	21.9	61.55	9.48	21.9	11.86	30.90
22.8	10.13	41.57	22.8	67.69	40.09	22.8	53.61	47.51	22.9	61.72	9.25	22.9	11.95	30.63
23.8	10.40	41.58	23.8	68.67	40.05	23.8	53.83	47.31	23.9	61.88	9.04	23.9	12.03	30.37
24.8	10.68	41.58	24.8	69.67	39.99	24.8	54.07	47.14	24.9	62.05	8.82	24.9	12.11	30.08
25.8	10.97	41.57	25.8	70.69	39.94	25.8	54.29	46.99	25.9	62.21	8.58	25.9	12.19	29.80
26.8	11.27	41.55	26.8	71.77	39.87	26.8	54.52	46.85	26.9	62.38	8.35	26.9	12.26	29.49
27.8	11.59	41.54	27.8	72.91	39.80	27.8	54.71	46.71	27.9	62.56	8.09	27.9	12.35	29.18
28.8	11.92	41.55	28.8	74.10	39.74	28.8	54.92	46.57	28.9	62.76	7.82	28.9	12.46	28.86
29.8	12.26	41.59	29.8	75.34	39.70	29.8	55.11	46.41	29.9	62.98	7.58	29.9	12.59	28.54
30.8	12.63	41.64	30.8	76.61	39.69	30.8	55.31	46.26	30.9	63.23	7.34	30.9	12.73	28.21
31.8	12.97	41.73	31.8	77.89	39.69	31.8	55.50	46.08	31.9	63.49	7.12	31.9	12.91	27.91
13.69	+13.66		50.32	+50.31		11.90	-11.86		12.30	+12.26		11.85	+11.81	
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			ζ Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m ° ' "		June	h m ° ' "		June	h m ° ' "		June	h m ° ' "		June	h m ° ' "	
	5 45 -84 49			6 46 -80 43			7 2 +87 10			7 13 +82 34			7 15 -86 54	
	s "			s "			s "			s "			s "	
1.0	51.78 49.52	1.1	47.50 49.76	1.1	2.96 63.42	1.1	43.46 38.61	1.1	44.76 22.18					
2.0	51.68 49.27	2.1	47.42 49.54	2.1	2.77 63.09	2.1	43.39 38.31	2.1	44.48 22.00					
3.0	51.57 49.03	3.1	47.34 49.33	3.1	2.62 62.75	3.1	43.33 38.00	3.1	44.19 21.81					
4.0	51.46 48.75	4.1	47.26 49.11	4.1	2.49 62.41	4.1	43.28 37.68	4.1	43.88 21.64					
5.0	51.33 48.47	5.1	47.17 48.88	5.1	2.40 62.08	5.1	43.24 37.38	5.1	43.57 21.46					
6.0	51.21 48.15	6.1	47.08 48.62	6.1	2.33 61.78	6.1	43.22 37.09	6.1	43.23 21.25					
7.0	51.10 47.83	7.1	46.99 48.35	7.1	2.28 61.49	7.1	43.21 36.82	7.1	42.89 21.02					
8.0	50.99 47.48	8.1	46.91 48.05	8.1	2.24 61.23	8.1	43.19 36.57	8.1	42.56 20.76					
9.0	50.90 47.13	9.1	46.83 47.73	9.1	2.16 60.97	9.1	43.16 36.32	9.1	42.26 20.49					
10.0	50.84 46.78	10.1	46.76 47.40	10.1	2.06 60.71	10.1	43.12 36.07	10.1	41.98 20.21					
11.0	50.79 46.44	11.1	46.70 47.07	11.1	1.93 60.43	11.1	43.07 35.81	11.1	41.74 19.92					
12.0	50.74 46.11	12.1	46.65 46.79	12.1	1.80 60.14	12.1	43.02 35.54	12.1	41.53 19.64					
13.0	50.70 45.83	13.1	46.60 46.51	13.1	1.65 59.83	13.1	42.96 35.24	13.1	41.33 19.40					
14.0	50.65 45.54	14.1	46.55 46.26	14.1	1.53 59.49	14.1	42.91 34.92	14.1	41.14 19.17					
15.0	50.60 45.27	15.1	46.50 46.02	15.1	1.43 59.15	15.1	42.86 34.59	15.1	40.93 18.95					
16.0	50.55 45.01	16.0	46.44 45.78	16.1	1.37 58.79	16.1	42.84 34.26	16.1	40.71 18.74					
17.0	50.48 44.74	17.0	46.39 45.54	17.1	1.34 58.44	17.1	42.83 33.91	17.1	40.47 18.52					
18.0	50.42 44.43	18.0	46.33 45.28	18.1	1.34 58.10	18.1	42.83 33.56	18.1	40.22 18.29					
18.9	50.36 44.11	19.0	46.27 44.98	19.1	1.35 57.77	19.1	42.84 33.25	19.1	39.98 18.04					
19.9	50.30 43.77	20.0	46.21 44.66	20.0	1.38 57.46	20.1	42.84 32.96	20.1	39.73 17.77					
20.9	50.26 43.41	21.0	46.15 44.31	21.0	1.41 57.16	21.1	42.85 32.69	21.1	39.50 17.48					
21.9	50.23 43.05	22.0	46.11 43.97	22.0	1.42 56.87	22.1	42.85 32.41	22.1	39.30 17.19					
22.9	50.22 42.69	23.0	46.07 43.63	23.0	1.42 56.58	23.0	42.85 32.13	23.0	39.10 16.88					
23.9	50.22 42.35	24.0	46.03 43.29	24.0	1.40 56.29	24.0	42.84 31.87	24.0	38.94 16.56					
24.9	50.22 42.02	25.0	46.00 42.95	25.0	1.37 56.00	25.0	42.84 31.59	25.0	38.79 16.26					
25.9	50.23 41.71	26.0	45.98 42.62	26.0	1.34 55.69	26.0	42.82 31.31	26.0	38.66 15.97					
26.9	50.24 41.38	27.0	45.97 42.33	27.0	1.31 55.37	27.0	42.80 31.00	27.0	38.54 15.69					
27.9	50.26 41.10	28.0	45.94 42.04	28.0	1.29 55.04	28.0	42.79 30.66	28.0	38.42 15.41					
28.9	50.27 40.83	29.0	45.91 41.76	29.0	1.28 54.69	29.0	42.78 30.32	29.0	38.31 15.15					
29.9	50.29 40.56	30.0	45.89 41.49	30.0	1.32 54.33	30.0	42.79 29.96	30.0	38.19 14.90					
30.9	50.29 40.27	31.0	45.87 41.22	31.0	1.39 53.96	31.0	42.82 29.60	31.0	38.06 14.65					
31.9	50.28 39.96	32.0	45.85 40.95	32.0	1.50 53.59	32.0	42.86 29.25	32.0	37.92 14.39					
11.10	-11.05	6.21	-6.13	20.35	+20.32	7.74	+7.67	18.52	-18.50					
5 ^h 46 ^m 14 ^s .756	6 ^h 46 ^m 58 ^s .546	7 ^h 2 ^m 4 ^s .048	7 ^h 13 ^m 42 ^s .294	7 ^h 16 ^m 20 ^s .292										
-84° 49' 46".89	-80° 43' 38".16	+87° 10' 54".74	+82° 34' 30".13	-86° 54' 6".70										

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "
	8 15	+88 53		9 8	-85 20		9 25	+81 41		9 36	-80 34		10 21	+82 58
	s	"		s	"		s	"		s	"		s	"
1.2	52.28	9.38	1.2	43.97	25.58	1.2	25.39	49.50	1.2	18.02	37.13	1.2	9.84	61.17
2.1	51.46	9.11	2.2	43.74	25.53	2.2	25.25	49.33	2.2	17.91	37.10	2.2	9.66	61.08
3.1	50.70	8.84	3.2	43.51	25.49	3.2	25.12	49.15	3.2	17.80	37.09	3.2	9.48	60.98
4.1	50.03	8.55	4.2	43.27	25.46	4.2	25.01	48.95	4.2	17.68	37.09	4.2	9.33	60.85
5.1	49.44	8.26	5.2	43.01	25.41	5.2	24.91	48.73	5.2	17.56	37.10	5.2	9.18	60.70
6.1	48.93	7.97	6.2	42.75	25.34	6.2	24.82	48.53	6.2	17.44	37.07	6.2	9.04	60.56
7.1	48.46	7.72	7.2	42.47	25.27	7.2	24.73	48.35	7.2	17.31	37.02	7.2	8.92	60.42
8.1	48.00	7.48	8.2	42.19	25.18	8.2	24.65	48.18	8.2	17.18	36.95	8.2	8.80	60.29
9.1	47.52	7.25	9.2	41.91	25.04	9.2	24.57	48.03	9.2	17.04	36.86	9.2	8.68	60.19
10.1	46.99	7.03	10.2	41.64	24.89	10.2	24.48	47.88	10.2	16.90	36.73	10.2	8.55	60.10
11.1	46.39	6.80	11.2	41.40	24.73	11.2	24.38	47.73	11.2	16.78	36.61	11.2	8.42	60.01
12.1	45.74	6.58	12.2	41.18	24.59	12.2	24.25	47.57	12.2	16.67	36.48	12.2	8.26	59.92
13.1	45.02	6.29	13.2	40.98	24.45	13.2	24.13	47.40	13.2	16.57	36.36	13.2	8.09	59.80
14.1	44.34	5.98	14.2	40.78	24.32	14.2	24.01	47.20	14.2	16.47	36.26	14.2	7.91	59.67
15.1	43.71	5.67	15.1	40.58	24.21	15.2	23.90	46.96	15.2	16.37	36.17	15.2	7.74	59.51
16.1	43.14	5.34	16.1	40.37	24.11	16.2	23.79	46.71	16.2	16.28	36.09	16.2	7.59	59.33
17.1	42.67	5.01	17.1	40.15	24.02	17.2	23.70	46.46	17.2	16.18	36.02	17.2	7.44	59.14
18.1	42.29	4.68	18.1	39.91	23.89	18.2	23.61	46.22	18.2	16.07	35.94	18.2	7.30	58.94
19.1	41.96	4.37	19.1	39.68	23.76	19.2	23.54	45.98	19.2	15.95	35.84	19.2	7.18	58.73
20.1	41.66	4.07	20.1	39.45	23.62	20.1	23.48	45.73	20.2	15.83	35.72	20.2	7.08	58.54
21.1	41.37	3.79	21.1	39.21	23.44	21.1	23.41	45.49	21.2	15.71	35.58	21.2	6.97	58.36
22.1	41.05	3.50	22.1	38.98	23.26	22.1	23.33	45.29	22.1	15.59	35.41	22.2	6.85	58.19
23.1	40.70	3.24	23.1	38.77	23.06	23.1	23.26	45.09	23.1	15.48	35.23	23.2	6.73	58.03
24.1	40.34	2.97	24.1	38.57	22.85	24.1	23.19	44.89	24.1	15.37	35.04	24.2	6.61	57.87
25.1	39.94	2.70	25.1	38.37	22.64	25.1	23.10	44.67	25.1	15.26	34.84	25.2	6.49	57.72
26.1	39.51	2.42	26.1	38.18	22.43	26.1	23.02	44.45	26.1	15.16	34.66	26.2	6.35	57.55
27.1	39.08	2.11	27.1	38.00	22.22	27.1	22.92	44.23	27.1	15.07	34.47	27.2	6.20	57.36
28.1	38.64	1.80	28.1	37.83	22.03	28.1	22.82	43.98	28.1	14.98	34.28	28.2	6.06	57.16
29.1	38.24	1.47	29.1	37.65	21.84	29.1	22.73	43.71	29.1	14.90	34.11	29.2	5.91	56.94
30.1	37.92	1.10	30.1	37.49	21.66	30.1	22.64	43.41	30.1	14.82	33.97	30.2	5.78	56.71
31.1	37.65	0.72	31.1	37.32	21.48	31.1	22.59	43.09	31.1	14.74	33.83	31.2	5.64	56.45
32.1	37.49	0.36	32.1	37.15	21.32	32.1	22.52	42.77	32.1	14.64	33.68	32.2	5.54	56.18
51.39	+51.38		12.31	-12.27		6.92	+6.85		6.11	-6.03		8.19	+8.12	
8 ^h 15 ^m 48 ^s .380			9 ^h 8 ^m 57 ^s .938			9 ^h 25 ^m 21 ^s .719			9 ^h 36 ^m 22 ^s .347			10 ^h 21 ^m 4 ^s .831		
+88° 53' 0".29			-85° 19' 57".45			+81° 41' 41".50			-80° 34' 6".83			+82° 58' 54".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m 10 59	° ' -84 9	June	h m 12 14	° ' +88 9	June	h m 12 46	° ' -84 40	June	h m 12 48	° ' +83 51	June	h m 13 27	° ' -85 22
	s "	"		s "	"		s "	"		s "	"		s "	"
1.3	54.59	24.73	1.3	47.44	40.21	1.3	17.45	54.91	1.3	38.04	53.08	1.4	30.68	12.27
2.3	54.43	24.82	2.3	46.71	40.28	2.3	17.32	55.11	2.3	37.84	53.22	2.4	30.56	12.51
3.3	54.25	24.91	3.3	45.99	40.33	3.3	17.19	55.33	3.3	37.64	53.32	3.4	30.45	12.77
4.3	54.09	25.03	4.3	45.28	40.37	4.3	17.06	55.56	4.3	37.43	53.41	4.4	30.34	13.04
5.3	53.90	25.14	5.3	44.60	40.38	5.3	16.92	55.79	5.3	37.24	53.47	5.4	30.21	13.31
6.3	53.70	25.25	6.3	43.97	40.37	6.3	16.75	56.03	6.3	37.06	53.52	6.4	30.06	13.60
7.2	53.49	25.35	7.3	43.35	40.36	7.3	16.58	56.27	7.3	36.90	53.56	7.4	29.90	13.88
8.2	53.26	25.42	8.3	42.78	40.35	8.3	16.39	56.50	8.3	36.74	53.61	8.3	29.72	14.16
9.2	53.03	25.47	9.3	42.24	40.38	9.3	16.19	56.70	9.3	36.59	53.69	9.3	29.52	14.41
10.2	52.81	25.49	10.3	41.66	40.42	10.3	15.98	56.88	10.3	36.43	53.78	10.3	29.30	14.62
11.2	52.60	25.48	11.3	41.06	40.46	11.3	15.77	57.02	11.3	36.26	53.87	11.3	29.09	14.82
12.2	52.41	25.47	12.3	40.41	40.50	12.3	15.57	57.15	12.3	36.07	53.97	12.3	28.90	15.02
13.2	52.22	25.45	13.3	39.71	40.54	13.3	15.39	57.29	13.3	35.87	54.06	13.3	28.71	15.19
14.2	52.04	25.45	14.3	38.97	40.57	14.3	15.24	57.41	14.3	35.65	54.16	14.3	28.56	15.35
15.2	51.88	25.47	15.3	38.21	40.57	15.3	15.09	57.53	15.3	35.43	54.23	15.3	28.40	15.52
16.2	51.71	25.50	16.3	37.46	40.54	16.3	14.93	57.68	16.3	35.21	54.27	16.3	28.26	15.72
17.2	51.54	25.53	17.3	36.71	40.51	17.3	14.78	57.84	17.3	35.01	54.28	17.3	28.09	15.93
18.2	51.35	25.57	18.3	36.02	40.46	18.3	14.61	58.01	18.3	34.81	54.28	18.3	27.92	16.13
19.2	51.16	25.61	19.3	35.37	40.37	19.3	14.43	58.18	19.3	34.62	54.27	19.3	27.75	16.34
20.2	50.95	25.63	20.3	34.76	40.30	20.3	14.23	58.34	20.3	34.44	54.26	20.3	27.55	16.55
21.2	50.73	25.60	21.3	34.16	40.24	21.3	14.02	58.48	21.3	34.27	54.25	21.3	27.32	16.75
22.2	50.50	25.57	22.3	33.57	40.19	22.3	13.80	58.60	22.3	34.09	54.25	22.3	27.09	16.93
23.2	50.30	25.52	23.3	32.99	40.15	23.3	13.57	58.69	23.3	33.92	54.26	23.3	26.86	17.08
24.2	50.09	25.46	24.3	32.39	40.12	24.3	13.35	58.76	24.3	33.74	54.27	24.3	26.63	17.22
25.2	49.89	25.37	25.3	31.76	40.08	25.3	13.13	58.82	25.3	33.56	54.29	25.3	26.39	17.35
26.2	49.69	25.28	26.2	31.11	40.03	26.3	12.92	58.89	26.3	33.37	54.31	26.3	26.15	17.45
27.2	49.51	25.20	27.2	30.43	39.99	27.3	12.73	58.94	27.3	33.16	54.33	27.3	25.94	17.55
28.2	49.34	25.11	28.2	29.72	39.94	28.3	12.54	58.99	28.3	32.94	54.34	28.3	25.74	17.63
29.2	49.17	25.05	29.2	28.99	39.89	29.3	12.35	59.06	29.3	32.73	54.33	29.3	25.55	17.73
30.2	49.01	24.98	30.2	28.26	39.79	30.3	12.18	59.14	30.3	32.51	54.30	30.3	25.36	17.85
31.2	48.84	24.93	31.2	27.53	39.67	31.3	12.01	59.23	31.3	32.30	54.24	31.3	25.17	17.98
32.2	48.68	24.89	32.2	26.83	39.53	32.3	11.83	59.31	32.3	32.09	54.16	32.3	24.99	18.13
9.82	-9.77		31.17	+31.15		10.79	-10.74		9.36	+9.30		12.39	-12.35	
10 ^h 59 ^m	55°.280		12 ^h 14 ^m	28°.425		12 ^h 46 ^m	7°.152		12 ^h 48 ^m	30°.418		13 ^h 27 ^m	14°.624	
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2233. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Urae Minoris. Mag. 4.4			ϵ G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June	14 13	-83 17	June	15 3	+87 33	June	15 24	-84 11	June	16 54	+82 10	June	17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
1.4	42.80	47.16	1.4	57.14	8.13	1.4	18.11	48.54	1.5	31.10	26.31	1.5	11.32	9.18
2.4	42.75	47.42	2.4	56.82	8.43	2.4	18.10	48.82	2.5	31.07	26.67	2.5	11.38	9.42
3.4	42.70	47.70	3.4	56.47	8.71	3.4	18.11	49.10	3.5	31.05	27.04	3.5	11.45	9.66
4.4	42.66	47.98	4.4	56.11	8.96	4.4	18.12	49.41	4.5	31.01	27.38	4.5	11.52	9.91
5.4	42.61	48.27	5.4	55.74	9.18	5.4	18.13	49.73	5.5	30.98	27.72	5.5	11.61	10.18
6.4	42.56	48.57	6.4	55.38	9.39	6.4	18.14	50.06	6.5	30.93	28.03	6.5	11.69	10.49
7.4	42.48	48.89	7.4	55.05	9.58	7.4	18.11	50.41	7.5	30.89	28.31	7.5	11.75	10.81
8.4	42.39	49.21	8.4	54.74	9.77	8.4	18.08	50.76	8.5	30.86	28.59	8.5	11.80	11.14
9.4	42.30	49.49	9.4	54.45	9.95	9.4	18.03	51.09	9.5	30.83	28.86	9.5	11.85	11.46
10.4	42.17	49.76	10.4	54.17	10.17	10.4	17.95	51.42	10.5	30.80	29.16	10.5	11.88	11.79
11.4	42.05	50.00	11.4	53.88	10.42	11.4	17.87	51.70	11.5	30.78	29.47	11.5	11.89	12.10
12.4	41.95	50.22	12.4	53.56	10.68	12.4	17.80	51.97	12.5	30.75	29.79	12.5	11.90	12.38
13.4	41.85	50.42	13.4	53.21	10.94	13.4	17.74	52.21	13.5	30.72	30.14	13.5	11.93	12.64
14.4	41.76	50.62	14.4	52.82	11.20	14.4	17.68	52.45	14.5	30.68	30.51	14.5	11.95	12.88
15.4	41.68	50.84	15.4	52.40	11.44	15.4	17.65	52.70	15.5	30.62	30.86	15.5	11.98	13.13
16.4	41.60	51.06	16.4	51.95	11.67	16.4	17.61	52.95	16.5	30.56	31.20	16.5	12.02	13.37
17.4	41.53	51.31	17.4	51.50	11.87	17.4	17.57	53.22	17.5	30.49	31.53	17.5	12.07	13.63
18.4	41.45	51.54	18.4	51.04	12.07	18.4	17.54	53.50	18.5	30.41	31.85	18.5	12.11	13.92
19.3	41.36	51.79	19.4	50.62	12.22	19.4	17.49	53.81	19.5	30.35	32.14	19.5	12.15	14.23
20.3	41.25	52.05	20.4	50.21	12.37	20.4	17.42	54.12	20.5	30.29	32.42	20.5	12.18	14.54
21.3	41.13	52.29	21.4	49.83	12.53	21.4	17.34	54.42	21.5	30.21	32.68	21.5	12.21	14.87
22.3	41.00	52.52	22.4	49.45	12.70	22.4	17.25	54.71	22.5	30.15	32.95	22.5	12.22	15.19
23.3	40.86	52.72	23.4	49.07	12.86	23.4	17.13	55.00	23.5	30.09	33.21	23.5	12.22	15.51
24.3	40.72	52.92	24.4	48.70	13.03	24.4	17.01	55.27	24.4	30.03	33.50	24.5	12.21	15.81
25.3	40.58	53.09	25.4	48.31	13.21	25.4	16.89	55.51	25.4	29.97	33.78	25.5	12.20	16.10
26.3	40.44	53.25	26.4	47.90	13.41	26.4	16.79	55.73	26.4	29.91	34.09	26.5	12.17	16.38
27.3	40.31	53.39	27.4	47.48	13.61	27.4	16.68	55.94	27.4	29.83	34.40	27.5	12.15	16.64
28.3	40.17	53.52	28.4	47.02	13.81	28.4	16.57	56.14	28.4	29.75	34.72	28.5	12.14	16.88
29.3	40.07	53.67	29.4	46.54	13.99	29.4	16.47	56.34	29.4	29.67	35.05	29.4	12.14	17.12
30.3	39.96	53.81	30.4	46.03	14.17	30.4	16.39	56.55	30.4	29.57	35.38	30.4	12.14	17.36
31.3	39.86	53.99	31.4	45.51	14.32	31.4	16.31	56.77	31.4	29.47	35.67	31.4	12.15	17.59
32.3	39.75	54.17	32.3	44.98	14.44	32.4	16.23	57.01	32.4	29.37	35.95	32.4	12.16	17.87
8.57	-8.51		23.42	+23.40		9.89	-9.84		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m	27°.793		15 ^h 3 ^m	41°.175		15 ^h 23 ^m	56°.594		16 ^h 54 ^m	25°.488		17 ^h 15 ^m	54°.896	
-83° 17'	21''.03		+87° 33'	10''.52		-84° 11'	30''.39		+82° 10'	32''.75		-80° 47'	6''.56	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursae Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursae Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			γ Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June 17 59	+86 36	"	June 18 7	-87 39	"	June 19 2	+89 0	"	June 19 30	-89 13	"	June 20 48	+82 13	"
1.6	8.97	43.35	1.6	9.48	46.59	1.6	51.42	53.43	1.6	11.00	11.65	1.7	41.99	20.81
2.6	9.02	43.72	2.6	9.78	46.82	2.6	51.96	53.76	2.6	12.23	11.80	2.7	42.14	21.06
3.5	9.06	44.08	3.6	10.10	47.05	3.6	52.42	54.11	3.6	13.52	11.96	3.7	42.28	21.33
4.5	9.06	44.44	4.6	10.46	47.27	4.6	52.78	54.45	4.6	14.91	12.12	4.7	42.40	21.61
5.5	9.05	44.78	5.5	10.82	47.53	5.6	53.07	54.77	5.6	16.37	12.28	5.7	42.53	21.89
6.5	9.03	45.10	6.5	11.19	47.81	6.6	53.30	55.07	6.6	17.86	12.46	6.7	42.63	22.14
7.5	9.01	45.39	7.5	11.52	48.12	7.6	53.51	55.36	7.6	19.32	12.69	7.7	42.73	22.39
8.5	9.01	45.67	8.5	11.82	48.45	8.6	53.73	55.63	8.6	20.72	12.93	8.7	42.83	22.62
9.5	9.01	45.95	9.5	12.09	48.77	9.6	54.03	55.90	9.6	22.01	13.17	9.7	42.93	22.84
10.5	9.04	46.24	10.5	12.30	49.10	10.6	54.39	56.17	10.6	23.15	13.45	10.6	43.03	23.07
11.5	9.07	46.55	11.5	12.47	49.41	11.6	54.79	56.46	11.6	24.16	13.70	11.6	43.16	23.29
12.5	9.09	46.88	12.5	12.62	49.69	12.6	55.22	56.77	12.6	25.08	13.94	12.6	43.28	23.53
13.5	9.10	47.24	13.5	12.77	49.95	13.6	55.63	57.10	13.6	25.96	14.14	13.6	43.40	23.81
14.5	9.11	47.61	14.5	12.94	50.19	14.6	55.99	57.46	14.6	26.87	14.35	14.6	43.53	24.11
15.5	9.08	47.98	15.5	13.14	50.44	15.6	56.26	57.82	15.6	27.82	14.54	15.6	43.64	24.43
16.5	9.04	48.35	16.5	13.36	50.68	16.6	56.44	58.20	16.6	28.86	14.74	16.6	43.75	24.75
17.5	8.96	48.71	17.5	13.59	50.95	17.6	56.54	58.56	17.6	29.97	14.94	17.6	43.85	25.08
18.5	8.87	49.05	18.5	13.83	51.22	18.6	56.56	58.90	18.6	31.10	15.16	18.6	43.95	25.40
19.5	8.78	49.37	19.5	14.06	51.53	19.5	56.56	59.23	19.6	32.24	15.41	19.6	44.04	25.71
20.5	8.69	49.67	20.5	14.25	51.85	20.5	56.56	59.55	20.6	33.34	15.68	20.6	44.12	26.00
21.5	8.61	49.96	21.5	14.42	52.18	21.5	56.56	59.83	21.6	34.39	15.95	21.6	44.19	26.29
22.5	8.53	50.26	22.5	14.56	52.51	22.5	56.59	60.13	22.6	35.32	16.23	22.6	44.27	26.55
23.5	8.47	50.55	23.5	14.66	52.84	23.5	56.67	60.42	23.6	36.17	16.51	23.6	44.35	26.82
24.5	8.42	50.86	24.5	14.72	53.16	24.5	56.75	60.73	24.6	36.93	16.81	24.6	44.44	27.10
25.5	8.36	51.17	25.5	14.77	53.47	25.5	56.87	61.04	25.6	37.60	17.11	25.6	44.52	27.38
26.5	8.30	51.48	26.5	14.81	53.77	26.5	56.98	61.35	26.5	38.20	17.38	26.6	44.61	27.66
27.5	8.21	51.82	27.5	14.84	54.05	27.5	57.09	61.70	27.5	38.76	17.63	27.6	44.69	27.98
28.5	8.13	52.16	28.5	14.86	54.33	28.5	57.15	62.05	28.5	39.31	17.88	28.6	44.79	28.30
29.5	8.03	52.53	29.5	14.90	54.59	29.5	57.13	62.41	29.5	39.90	18.13	29.6	44.87	28.63
30.5	7.90	52.89	30.5	14.97	54.85	30.5	57.05	62.78	30.5	40.54	18.37	30.6	44.95	29.00
31.5	7.74	53.24	31.5	15.07	55.11	31.5	56.88	63.17	31.5	41.26	18.60	31.6	45.03	29.38
32.5	7.56	53.58	32.5	15.18	55.38	32.5	56.60	63.53	32.5	42.04	18.85	32.6	45.09	29.76
16.93	+16.90		24.53	-24.51		58.23	+58.23		73.52	-73.52		7.39	+7.32	
17 ^h 59 ^m	1° 30'		18 ^h 6 ^m	11° 89'		19 ^h 2 ^m	39° 62'		19 ^h 27 ^m	42° 218'		20 ^h 48 ^m	40° 494'	
+86° 36'	51° 17'		-87° 39'	51° 82'		+89° 1'	2° 17'		-89° 13'	28° 57'		+82° 13'	29° 86'	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "
	21 38	-83 5		22 16	-86 22		22 37	-81 48		23 27	+86 50		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.7	30.73	37.15	1.7	22.45	54.78	1.7	44.91	29.49	1.8	38.05	53.04	1.8	17.39	14.66
2.7	30.90	37.12	2.7	22.77	54.72	2.7	45.05	29.39	2.8	38.49	53.06	2.8	17.53	14.50
3.7	31.08	37.09	3.7	23.09	54.64	3.7	45.20	29.28	3.8	38.94	53.10	3.8	17.67	14.30
4.7	31.27	37.06	4.7	23.45	54.57	4.7	45.36	29.16	4.8	39.37	53.16	4.8	17.82	14.10
5.7	31.49	37.04	5.7	23.81	54.50	5.7	45.53	29.05	5.8	39.75	53.24	5.8	17.99	13.89
6.7	31.70	37.03	6.7	24.22	54.43	6.7	45.71	28.95	6.8	40.14	53.31	6.8	18.16	13.70
7.7	31.92	37.05	7.7	24.62	54.40	7.7	45.89	28.89	7.8	40.51	53.38	7.8	18.34	13.52
8.7	32.13	37.09	8.7	25.03	54.40	8.7	46.08	28.83	8.8	40.84	53.44	8.8	18.53	13.36
9.7	32.35	37.17	9.7	25.42	54.40	9.7	46.26	28.80	9.8	41.19	53.49	9.8	18.73	13.22
10.7	32.54	37.25	10.7	25.80	54.45	10.7	46.44	28.79	10.8	41.54	53.53	10.8	18.90	13.11
11.7	32.71	37.34	11.7	26.14	54.49	11.7	46.59	28.79	11.8	41.91	53.56	11.8	19.07	13.03
12.7	32.87	37.42	12.7	26.46	54.52	12.7	46.72	28.79	12.8	42.31	53.59	12.8	19.22	12.95
13.7	33.04	37.48	13.7	26.76	54.55	13.7	46.87	28.79	13.7	42.74	53.64	13.8	19.36	12.87
14.7	33.18	37.54	14.7	27.04	54.58	14.7	47.00	28.78	14.7	43.19	53.71	14.8	19.50	12.78
15.7	33.34	37.59	15.7	27.35	54.59	15.7	47.14	28.74	15.7	43.64	53.81	15.8	19.64	12.66
16.7	33.51	37.62	16.7	27.65	54.60	16.7	47.29	28.70	16.7	44.07	53.93	16.8	19.79	12.54
17.7	33.68	37.66	17.7	27.98	54.60	17.7	47.46	28.67	17.7	44.49	54.06	17.8	19.95	12.42
18.7	33.87	37.71	18.7	28.35	54.59	18.7	47.62	28.63	18.7	44.88	54.21	18.8	20.13	12.29
19.7	34.07	37.79	19.7	28.72	54.62	19.7	47.79	28.62	19.7	45.26	54.35	19.7	20.31	12.18
20.7	34.26	37.88	20.7	29.09	54.66	20.7	47.97	28.62	20.7	45.61	54.49	20.7	20.48	12.08
21.7	34.46	37.98	21.7	29.46	54.73	21.7	48.15	28.64	21.7	45.95	54.61	21.7	20.67	12.01
22.7	34.64	38.10	22.7	29.83	54.81	22.7	48.31	28.67	22.7	46.28	54.74	22.7	20.86	11.96
23.6	34.82	38.25	23.7	30.17	54.91	23.7	48.48	28.73	23.7	46.62	54.84	23.7	21.04	11.91
24.6	34.98	38.40	24.7	30.50	55.03	24.7	48.63	28.81	24.7	46.98	54.94	24.7	21.21	11.88
25.6	35.13	38.55	25.7	30.82	55.15	25.7	48.77	28.88	25.7	47.34	55.07	25.7	21.38	11.86
26.6	35.27	38.70	26.7	31.11	55.28	26.7	48.91	28.96	26.7	47.72	55.18	26.7	21.54	11.85
27.6	35.42	38.85	27.7	31.39	55.37	27.7	49.04	29.03	27.7	48.12	55.30	27.7	21.68	11.84
28.6	35.55	38.99	28.7	31.66	55.48	28.7	49.17	29.09	28.7	48.52	55.44	28.7	21.83	11.83
29.6	35.68	39.12	29.7	31.93	55.58	29.7	49.30	29.14	29.7	48.94	55.61	29.7	21.98	11.81
30.6	35.82	39.22	30.7	32.21	55.67	30.7	49.43	29.19	30.7	49.35	55.79	30.7	22.13	11.78
31.6	35.98	39.32	31.7	32.50	55.73	31.7	49.57	29.24	31.7	49.76	56.01	31.7	22.28	11.73
32.6	36.15	39.44	32.6	32.82	55.79	32.7	49.73	29.27	32.7	50.13	56.23	32.7	22.45	11.67
8.32	-8.26		15.85	-15.81		7.02	-6.95		18.19	+18.16		7.63	-7.56	
21 ^h 38 ^m 19 ^s .542			22 ^h 16 ^m 8 ^s .656			22 ^h 37 ^m 39 ^s .016			23 ^h 27 ^m 44 ^s .125			23 ^h 47 ^m 16 ^s .424		
-83° 6' 6".99			-86° 23' 27".13			-81° 49' 2".34			+86° 50' 58".89			-82° 28' 48".42		

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CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m ° ' "		July	h m ° ' "		July	h m ° ' "		July	h m ° ' "		July	h m ° ' "	
	0 57	+85 48		1 30	+88 51		1 41	-85 10		4 10	+85 20		5 35	+85 9
0.8	12.63	41.64	0.8	16.61	39.69	0.8	55.31	46.26	0.9	3.23	7.34	0.9	12.73	28.21
1.8	12.97	41.73	1.8	17.89	39.69	1.8	55.50	46.08	1.9	3.49	7.12	1.9	12.91	27.91
2.8	13.31	41.83	2.8	19.14	39.74	2.8	55.71	45.91	2.9	3.76	6.92	2.9	13.09	27.62
3.8	13.64	41.94	3.8	20.32	39.80	3.8	55.93	45.71	3.9	4.02	6.76	3.9	13.28	27.38
4.8	13.94	42.07	4.8	21.43	39.87	4.8	56.17	45.51	4.9	4.27	6.61	4.9	13.47	27.14
5.8	14.23	42.18	5.8	22.48	39.93	5.8	56.43	45.34	5.9	4.51	6.47	5.9	13.64	26.91
6.7	14.51	42.28	6.8	23.48	39.98	6.8	56.70	45.19	6.9	4.74	6.34	6.9	13.79	26.68
7.7	14.78	42.37	7.8	24.47	40.02	7.8	56.97	45.07	7.9	4.94	6.19	7.9	13.94	26.45
8.7	15.05	42.43	8.8	25.49	40.04	8.8	57.22	44.98	8.9	5.15	6.01	8.9	14.08	26.21
9.7	15.33	42.49	9.8	26.58	40.04	9.8	57.47	44.91	9.9	5.37	5.82	9.9	14.21	25.94
10.7	15.66	42.55	10.8	27.73	40.04	10.8	57.69	44.85	10.9	5.59	5.60	10.9	14.34	25.66
11.7	15.99	42.63	11.8	28.98	40.06	11.8	57.91	44.79	11.9	5.84	5.38	11.9	14.50	25.34
12.7	16.34	42.73	12.8	30.26	40.11	12.8	58.11	44.73	12.9	6.11	5.18	12.9	14.68	25.04
13.7	16.69	42.86	13.8	31.56	40.16	13.8	58.32	44.64	13.9	6.39	4.99	13.9	14.88	24.75
14.7	17.04	43.00	14.8	32.85	40.26	14.8	58.54	44.54	14.9	6.69	4.84	14.9	15.11	24.46
15.7	17.37	43.16	15.7	34.08	40.36	15.8	58.76	44.44	15.9	6.99	4.70	15.9	15.33	24.20
16.7	17.69	43.33	16.7	35.24	40.48	16.8	59.00	44.33	16.9	7.27	4.58	16.9	15.55	23.96
17.7	17.97	43.50	17.7	36.34	40.61	17.8	59.27	44.21	17.9	7.56	4.47	17.9	15.77	23.75
18.7	18.25	43.66	18.7	37.39	40.72	18.7	59.53	44.11	18.9	7.83	4.38	18.9	15.97	23.56
19.7	18.51	43.82	19.7	38.41	40.82	19.7	59.79	44.06	19.8	8.07	4.28	19.9	16.17	23.37
20.7	18.78	43.97	20.7	39.41	40.93	20.7	60.07	44.01	20.8	8.32	4.18	20.9	16.37	23.17
21.7	19.04	44.11	21.7	40.43	41.02	21.7	60.34	43.99	21.8	8.56	4.07	21.9	16.55	22.95
22.7	19.31	44.25	22.7	41.45	41.11	22.7	60.61	43.99	22.8	8.81	3.95	22.9	16.72	22.73
23.7	19.59	44.38	23.7	42.51	41.20	23.7	60.85	43.98	23.8	9.05	3.81	23.9	16.90	22.50
24.7	19.88	44.53	24.7	43.64	41.29	24.7	61.09	44.02	24.8	9.31	3.67	24.9	17.09	22.26
25.7	20.19	44.68	25.7	44.80	41.38	25.7	61.32	44.04	25.8	9.58	3.53	25.9	17.28	22.02
26.7	20.50	44.83	26.7	46.01	41.49	26.7	61.55	44.04	26.8	9.87	3.39	26.9	17.51	21.77
27.7	20.83	45.01	27.7	47.25	41.62	27.7	61.75	44.04	27.8	10.17	3.25	27.9	17.75	21.52
28.7	21.16	45.23	28.7	48.49	41.76	28.7	61.97	44.03	28.8	10.49	3.15	28.9	18.00	21.28
29.7	21.47	45.46	29.7	49.71	41.95	29.7	62.20	44.01	29.8	10.83	3.07	29.9	18.27	21.07
30.7	21.76	45.70	30.7	50.89	42.14	30.7	62.43	43.99	30.8	11.16	3.01	30.9	18.55	20.87
31.7	22.05	45.97	31.7	51.98	42.35	31.7	62.68	43.97	31.8	11.49	2.96	31.9	18.83	20.71
13.69 +13.66			50.32 +50.31			11.90 -11.86			12.29 +12.25			11.84 +11.80		
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			C Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			35 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
July	5 45	-84 49	July	6 46	-80 43	July	7 2	+87 10	July	7 13	+82 34	July	7 15	-86 54
	s	"		s	"		s	"		s	"		s	"
0.9	50.29	40.27	1.0	45.87	41.22	1.0	1.39	53.96	1.0	42.82	29.60	1.0	38.06	14.65
1.9	50.28	39.96	2.0	45.85	40.95	2.0	1.50	53.59	2.0	42.86	29.25	2.0	37.92	14.39
2.9	50.28	39.65	3.0	45.82	40.64	3.0	1.63	53.24	3.0	42.91	28.92	3.0	37.76	14.12
3.9	50.27	39.34	3.9	45.79	40.33	4.0	1.78	52.92	4.0	42.97	28.62	4.0	37.59	13.81
4.9	50.27	39.00	4.9	45.77	40.00	5.0	1.94	52.62	5.0	43.03	28.32	5.0	37.43	13.50
5.9	50.30	38.63	5.9	45.75	39.65	6.0	2.09	52.34	6.0	43.08	28.03	6.0	37.29	13.18
6.9	50.34	38.27	6.9	45.74	39.29	7.0	2.21	52.06	7.0	43.13	27.76	7.0	37.18	12.84
7.9	50.39	37.93	7.9	45.73	38.93	7.9	2.31	51.78	8.0	43.17	27.49	8.0	37.10	12.49
8.9	50.45	37.59	8.9	45.74	38.59	8.9	2.38	51.48	9.0	43.18	27.22	9.0	37.05	12.17
9.9	50.52	37.27	9.9	45.75	38.27	9.9	2.44	51.17	10.0	43.20	26.92	10.0	37.02	11.85
10.9	50.59	36.99	10.9	45.76	37.98	10.9	2.52	50.82	10.9	43.23	26.57	10.9	37.01	11.56
11.9	50.66	36.74	11.9	45.77	37.69	11.9	2.61	50.46	11.9	43.26	26.21	11.9	36.99	11.29
12.9	50.72	36.49	12.9	45.78	37.42	12.9	2.73	50.10	12.9	43.30	25.86	12.9	36.96	11.03
13.9	50.78	36.22	13.9	45.79	37.14	13.9	2.90	49.73	13.9	43.36	25.51	13.9	36.93	10.76
14.9	50.82	35.95	14.9	45.79	36.86	14.9	3.09	49.37	14.9	43.44	25.16	14.9	36.87	10.50
15.9	50.87	35.66	15.9	45.80	36.56	15.9	3.32	49.03	15.9	43.52	24.82	15.9	36.80	10.21
16.9	50.93	35.35	16.9	45.81	36.25	16.9	3.54	48.72	16.9	43.61	24.51	16.9	36.74	9.90
17.9	50.99	35.04	17.9	45.82	35.92	17.9	3.77	48.43	17.9	43.70	24.22	17.9	36.69	9.58
18.9	51.08	34.71	18.9	45.83	35.58	18.9	3.99	48.14	18.9	43.78	23.94	18.9	36.65	9.26
19.9	51.17	34.39	19.9	45.85	35.21	19.9	4.19	47.87	19.9	43.85	23.66	19.9	36.65	8.92
20.9	51.27	34.06	20.9	45.88	34.86	20.9	4.38	47.59	20.9	43.91	23.38	20.9	36.65	8.57
21.9	51.40	33.75	21.9	45.91	34.52	21.9	4.56	47.31	21.9	43.98	23.11	21.9	36.69	8.24
22.9	51.52	33.46	22.9	45.95	34.19	22.9	4.73	47.01	22.9	44.04	22.83	22.9	36.74	7.91
23.9	51.64	33.19	23.9	45.99	33.88	23.9	4.90	46.71	23.9	44.10	22.54	23.9	36.81	7.60
24.9	51.77	32.94	24.9	46.03	33.59	24.9	5.07	46.39	24.9	44.16	22.23	24.9	36.89	7.30
25.9	51.90	32.70	25.9	46.08	33.30	25.9	5.25	46.06	25.9	44.23	21.90	25.9	36.97	7.02
26.9	52.01	32.48	26.9	46.13	33.04	26.9	5.47	45.74	26.9	44.31	21.57	26.9	37.05	6.75
27.9	52.12	32.25	27.9	46.17	32.78	27.9	5.71	45.40	27.9	44.39	21.23	27.9	37.12	6.50
28.9	52.23	32.01	28.9	46.21	32.51	28.9	5.98	45.06	28.9	44.50	20.90	28.9	37.17	6.24
29.9	52.34	31.76	29.9	46.25	32.23	29.9	6.29	44.74	29.9	44.62	20.58	29.9	37.21	5.97
30.9	52.44	31.50	30.9	46.28	31.94	30.9	6.63	44.43	30.9	44.75	20.28	30.9	37.25	5.69
31.9	52.55	31.22	31.9	46.32	31.63	31.9	6.99	44.14	31.9	44.88	19.99	31.9	37.27	5.39
11.09	-11.04		6.20	-6.12		20.33	+20.30		7.74	+7.67		18.51	-18.48	
5 ^h 46 ^m 14 ^s .756			6 ^h 46 ^m 58 ^s .546			7 ^h 2 ^m 4 ^s .048			7 ^h 13 ^m 42 ^s .294			7 ^h 16 ^m 20 ^s .292		
-84° 49' 46".89			-80° 43' 38".16			+87° 10' 54".74			+82° 34' 30".13			-86° 54' 6".70		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			♎ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			♏ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
July	h m 8 15	° ' " +88 52	July	h m 9 8	° ' " -85 20	July	h m 9 25	° ' " +81 41	July	h m 9 36	° ' " -80 34	July	h m 10 21	° ' " +82 58
	s "	"		s "	"		s "	"		s "	"		s "	"
1.1	37.65	60.72	1.1	37.32	21.48	1.1	22.59	43.09	1.1	14.74	33.83	1.2	5.64	56.45
2.1	37.49	60.36	2.1	37.15	21.32	2.1	22.52	42.77	2.1	14.64	33.68	2.2	5.54	56.18
3.1	37.42	60.02	3.1	36.97	21.16	3.1	22.47	42.44	3.1	14.55	33.54	3.2	5.44	55.91
4.1	37.41	59.67	4.1	36.77	20.97	4.1	22.44	42.15	4.1	14.46	33.37	4.1	5.36	55.64
5.1	37.42	59.35	5.1	36.57	20.74	5.1	22.41	41.85	5.1	14.36	33.18	5.1	5.28	55.38
6.1	37.44	59.03	6.1	36.36	20.50	6.1	22.39	41.56	6.1	14.26	32.97	6.1	5.20	55.15
7.1	37.41	58.75	7.1	36.17	20.23	7.1	22.34	41.30	7.1	14.16	32.74	7.1	5.12	54.91
8.1	37.30	58.47	8.1	35.99	19.96	8.1	22.30	41.06	8.1	14.06	32.49	8.1	5.03	54.71
9.0	37.14	58.16	9.1	35.84	19.70	9.1	22.24	40.82	9.1	13.97	32.23	9.1	4.93	54.48
10.0	36.94	57.83	10.1	35.71	19.44	10.1	22.17	40.55	10.1	13.90	31.98	10.1	4.82	54.26
11.0	36.73	57.49	11.1	35.60	19.18	11.1	22.11	40.27	11.1	13.84	31.74	11.1	4.69	54.00
12.0	36.55	57.12	12.1	35.50	18.95	12.1	22.03	39.96	12.1	13.78	31.51	12.1	4.58	53.73
13.0	36.44	56.74	13.1	35.38	18.75	13.1	21.98	39.62	13.1	13.72	31.31	13.1	4.47	53.44
14.0	36.43	56.36	14.1	35.25	18.55	14.1	21.93	39.26	14.1	13.66	31.12	14.1	4.36	53.12
15.0	36.49	55.96	15.1	35.13	18.33	15.1	21.90	38.90	15.1	13.59	30.93	15.1	4.27	52.80
16.0	36.63	55.60	16.1	34.99	18.09	16.1	21.88	38.56	16.1	13.51	30.71	16.1	4.21	52.48
17.0	36.81	55.27	17.1	34.84	17.85	17.1	21.87	38.25	17.1	13.43	30.47	17.1	4.15	52.17
18.0	37.00	54.93	18.1	34.70	17.58	18.1	21.86	37.92	18.1	13.36	30.21	18.1	4.09	51.88
19.0	37.20	54.59	19.1	34.56	17.31	19.1	21.85	37.61	19.1	13.28	29.94	19.1	4.03	51.59
20.0	37.37	54.28	20.1	34.43	17.01	20.1	21.84	37.33	20.1	13.21	29.65	20.1	3.98	51.31
21.0	37.51	53.98	21.1	34.30	16.71	21.1	21.81	37.05	21.1	13.14	29.35	21.1	3.90	51.05
22.0	37.60	53.68	22.0	34.20	16.39	22.1	21.78	36.76	22.1	13.08	29.06	22.1	3.83	50.77
23.0	37.67	53.36	23.0	34.11	16.09	23.1	21.75	36.46	23.1	13.02	28.77	23.1	3.75	50.50
24.0	37.73	53.04	24.0	34.03	15.80	24.1	21.72	36.16	24.1	12.97	28.47	24.1	3.67	50.23
25.0	37.79	52.69	25.0	33.98	15.50	25.1	21.68	35.84	25.1	12.93	28.18	25.1	3.59	49.94
26.0	37.87	52.32	26.0	33.92	15.22	26.1	21.65	35.49	26.1	12.89	27.91	26.1	3.50	49.62
26.9	38.01	51.96	27.0	33.87	14.96	27.0	21.62	35.14	27.1	12.86	27.65	27.1	3.41	49.30
27.9	38.20	51.58	28.0	33.81	14.70	28.0	21.61	34.78	28.1	12.82	27.41	28.1	3.34	48.96
28.9	38.49	51.19	29.0	33.75	14.46	29.0	21.60	34.41	29.0	12.78	27.18	29.1	3.29	48.61
29.9	38.87	50.81	30.0	33.67	14.20	30.0	21.61	34.03	30.0	12.74	26.95	30.1	3.24	48.24
30.9	39.33	50.43	31.0	33.59	13.93	31.0	21.65	33.66	31.0	12.70	26.70	31.1	3.21	47.86
31.9	39.83	50.08	32.0	33.50	13.66	32.0	21.67	33.31	32.0	12.65	26.43	32.1	3.20	47.51
51.26 +51.25			12.30 -12.26			6.92 +6.85			6.11 -6.02			8.18 +8.12		
8 ^h 15 ^m 48 ^s .380			9 ^h 8 ^m 57 ^s .938			9 ^h 25 ^m 21 ^s .719			9 ^h 36 ^m 22 ^s .347			10 ^h 21 ^m 4 ^s .831		
+88° 53' 0".29			-85° 19' 57".45			+81° 41' 41".50			-80° 34' 6".83			+82° 58' 54".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m 10 59	° -84 9	July	h m 12 14	° +88 9	July	h m 12 46	° -84 40	July	h m 12 48	° +83 51	July	h m 13 27	° -85 22
	s "	"		s "	"		s "	"		s "	"		s "	"
1.2	48.84	24.93	1.2	27.53	39.67	1.3	12.01	59.23	1.3	32.30	54.24	1.3	25.17	17.98
2.2	48.68	24.89	2.2	26.83	39.53	2.3	11.83	59.31	2.3	32.09	54.16	2.3	24.99	18.13
3.2	48.51	24.85	3.2	26.17	39.37	3.3	11.65	59.40	3.3	31.89	54.07	3.3	24.80	18.29
4.2	48.31	24.80	4.2	25.57	39.21	4.2	11.46	59.50	4.2	31.70	53.97	4.3	24.58	18.45
5.2	48.11	24.75	5.2	25.01	39.07	5.2	11.24	59.58	5.2	31.53	53.86	5.3	24.35	18.59
6.2	47.91	24.66	6.2	24.47	38.92	6.2	11.00	59.65	6.2	31.37	53.76	6.3	24.09	18.71
7.2	47.70	24.52	7.2	23.93	38.80	7.2	10.77	59.68	7.2	31.20	53.68	7.3	23.83	18.81
8.2	47.50	24.38	8.2	23.38	38.67	8.2	10.52	59.69	8.2	31.03	53.62	8.3	23.56	18.88
9.2	47.32	24.23	9.2	22.78	38.57	9.2	10.30	59.68	9.2	30.85	53.57	9.3	23.31	18.92
10.2	47.14	24.07	10.2	22.13	38.46	10.2	10.09	59.65	10.2	30.65	53.52	10.3	23.06	18.94
11.2	47.00	23.92	11.2	21.43	38.34	11.2	9.90	59.62	11.2	30.43	53.46	11.3	22.84	18.97
12.2	46.85	23.78	12.2	20.74	38.20	12.2	9.71	59.60	12.2	30.21	53.38	12.3	22.64	18.99
13.1	46.71	23.68	13.2	20.02	38.03	13.2	9.55	59.59	13.2	29.99	53.28	13.3	22.45	19.03
14.1	46.58	23.57	14.2	19.34	37.84	14.2	9.38	59.60	14.2	29.79	53.14	14.2	22.26	19.09
15.1	46.43	23.44	15.2	18.68	37.64	15.2	9.20	59.61	15.2	29.59	53.00	15.2	22.06	19.15
16.1	46.26	23.32	16.2	18.08	37.43	16.2	9.00	59.61	16.2	29.40	52.85	16.2	21.84	19.21
17.1	46.09	23.19	17.2	17.52	37.21	17.2	8.79	59.62	17.2	29.22	52.69	17.2	21.61	19.28
18.1	45.91	23.05	18.2	17.00	37.00	18.2	8.57	59.62	18.2	29.05	52.53	18.2	21.36	19.33
19.1	45.73	22.87	19.2	16.48	36.80	19.2	8.35	59.60	19.2	28.88	52.37	19.2	21.09	19.37
20.1	45.56	22.68	20.2	15.97	36.61	20.2	8.12	59.55	20.2	28.73	52.22	20.2	20.82	19.39
21.1	45.39	22.48	21.2	15.46	36.43	21.2	7.88	59.49	21.2	28.56	52.09	21.2	20.56	19.38
22.1	45.22	22.25	22.2	14.94	36.25	22.2	7.66	59.41	22.2	28.39	51.96	22.2	20.29	19.35
23.1	45.07	22.03	23.2	14.38	36.07	23.2	7.44	59.32	23.2	28.21	51.84	23.2	20.03	19.31
24.1	44.93	21.81	24.2	13.81	35.89	24.2	7.24	59.22	24.2	28.03	51.70	24.2	19.78	19.26
25.1	44.80	21.59	25.2	13.21	35.70	25.2	7.04	59.09	25.2	27.84	51.58	25.2	19.54	19.21
26.1	44.67	21.37	26.2	12.60	35.51	26.2	6.86	58.98	26.2	27.64	51.44	26.2	19.32	19.15
27.1	44.56	21.16	27.2	11.97	35.27	27.2	6.68	58.90	27.2	27.44	51.27	27.2	19.12	19.10
28.1	44.45	20.98	28.2	11.35	35.02	28.2	6.52	58.82	28.2	27.24	51.08	28.2	18.92	19.07
29.1	44.33	20.81	29.2	10.75	34.76	29.2	6.35	58.75	29.2	27.05	50.87	29.2	18.72	19.05
30.1	44.21	20.63	30.2	10.19	34.48	30.2	6.18	58.69	30.2	26.86	50.64	30.2	18.51	19.04
31.1	44.09	20.46	31.2	9.70	34.18	31.2	5.99	58.63	31.2	26.71	50.41	31.2	18.29	19.04
32.1	43.94	20.27	32.1	9.23	33.87	32.2	5.80	58.57	32.2	26.55	50.16	32.2	18.06	19.03
9.82	-9.77		31.15	+31.14		10.79	-10.75		9.36	+9.30		12.39	-12.35	
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "
	14 13	-83 17		15 3	+87 33		15 24	-84 11		16 54	+82 10		17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
1.3	39.86	53.99	1.4	45.51	14.32	1.4	16.31	56.77	1.4	29.47	35.67	1.4	12.15	17.59
2.3	39.75	54.17	2.3	44.98	14.44	2.4	16.23	57.01	2.4	29.37	35.95	2.4	12.16	17.87
3.3	39.65	54.36	3.3	44.45	14.54	3.4	16.15	57.27	3.4	29.25	36.21	3.4	12.17	18.15
4.3	39.51	54.56	4.3	43.94	14.62	4.4	16.07	57.53	4.4	29.15	36.45	4.4	12.18	18.44
5.3	39.39	54.76	5.3	43.47	14.68	5.4	15.95	57.80	5.4	29.04	36.68	5.4	12.18	18.76
6.3	39.22	54.95	6.3	43.01	14.75	6.4	15.82	58.07	6.4	28.94	36.89	6.4	12.18	19.08
7.3	39.06	55.10	7.3	42.59	14.84	7.3	15.68	58.30	7.4	28.84	37.11	7.4	12.14	19.40
8.3	38.89	55.23	8.3	42.15	14.96	8.3	15.52	58.53	8.4	28.75	37.35	8.4	12.10	19.68
9.3	38.73	55.34	9.3	41.70	15.08	9.3	15.35	58.71	9.4	28.66	37.58	9.4	12.06	19.95
10.3	38.58	55.42	10.3	41.23	15.22	10.3	15.20	58.87	10.4	28.56	37.86	10.4	12.00	20.19
11.3	38.44	55.48	11.3	40.71	15.35	11.3	15.06	59.01	11.4	28.44	38.15	11.4	11.96	20.42
12.3	38.30	55.56	12.3	40.16	15.49	12.3	14.93	59.16	12.4	28.32	38.44	12.4	11.93	20.63
13.3	38.17	55.62	13.3	39.60	15.60	13.3	14.81	59.31	13.4	28.19	38.73	13.4	11.90	20.85
14.3	38.05	55.72	14.3	39.02	15.69	14.3	14.71	59.48	14.4	28.06	39.00	14.4	11.87	21.06
15.3	37.94	55.83	15.3	38.45	15.75	15.3	14.60	59.66	15.4	27.93	39.23	15.4	11.85	21.31
16.3	37.81	55.95	16.3	37.88	15.81	16.3	14.48	59.85	16.4	27.80	39.44	16.4	11.83	21.58
17.3	37.67	56.05	17.3	37.35	15.84	17.3	14.34	60.04	17.4	27.66	39.63	17.4	11.80	21.85
18.3	37.49	56.17	18.3	36.84	15.87	18.3	14.19	60.23	18.4	27.54	39.82	18.4	11.77	22.13
19.3	37.33	56.28	19.3	36.34	15.89	19.3	14.02	60.41	19.4	27.41	40.00	19.4	11.72	22.40
20.3	37.16	56.36	20.3	35.87	15.91	20.3	13.85	60.60	20.4	27.29	40.18	20.4	11.66	22.67
21.3	36.97	56.42	21.3	35.39	15.94	21.3	13.67	60.75	21.4	27.17	40.36	21.4	11.60	22.94
22.3	36.80	56.46	22.3	34.90	15.98	22.3	13.48	60.89	22.4	27.04	40.56	22.4	11.52	23.18
23.3	36.62	56.52	23.3	34.40	16.04	23.3	13.29	61.02	23.4	26.93	40.78	23.4	11.44	23.42
24.3	36.44	56.50	24.3	33.89	16.10	24.3	13.10	61.13	24.4	26.80	41.00	24.4	11.36	23.62
25.3	36.29	56.50	25.3	33.36	16.16	25.3	12.92	61.22	25.4	26.66	41.21	25.4	11.28	23.81
26.2	36.14	56.49	26.3	32.80	16.21	26.3	12.76	61.30	26.4	26.53	41.44	26.4	11.22	23.99
27.2	35.99	56.49	27.3	32.21	16.26	27.3	12.61	61.37	27.4	26.38	41.67	27.4	11.16	24.16
28.2	35.85	56.51	28.3	31.61	16.28	28.3	12.47	61.46	28.4	26.22	41.87	28.4	11.10	24.35
29.2	35.72	56.54	29.3	31.01	16.28	29.3	12.33	61.55	29.4	26.05	42.07	29.4	11.04	24.54
30.2	35.59	56.57	30.3	30.40	16.25	30.3	12.18	61.67	30.3	25.89	42.25	30.4	11.00	24.75
31.2	35.45	56.61	31.3	29.83	16.20	31.3	12.04	61.80	31.3	25.72	42.40	31.4	10.95	24.97
32.2	35.28	56.67	32.3	29.26	16.12	32.3	11.88	61.94	32.3	25.58	42.50	32.4	10.90	25.20
8.57	-8.51		23.43	+23.41		9.89	-9.84		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m	27° 79.3		15 ^h 3 ^m	41° 17.5		15 ^h 23 ^m	56° 59.4		16 ^h 54 ^m	25° 48.8		17 ^h 15 ^m	54° 89.6	
-83° 17'	21'' .03		+87° 33'	10'' .52		-84° 11'	30'' .89		+82° 10'	32'' .75		-80° 47'	6'' .56	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

♂ Ursa Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursa Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "	July	h m	° ' "
17 59	+86 36		18 7	-87 39		19 2	+89 1		19 30	-89 13		20 48	+82 13	
1.5	7.74	53.24	1.5	15.07	55.11	1.5	56.88	3.17	1.5	41.26	18.60	1.6	45.03	29.38
2.5	7.56	53.58	2.5	15.18	55.38	2.5	56.60	3.53	2.5	42.04	18.85	2.6	45.09	29.76
3.5	7.38	53.89	3.5	15.29	55.68	3.5	56.25	3.87	3.5	42.88	19.11	3.6	45.14	30.13
4.5	7.18	54.19	4.5	15.41	55.99	4.5	55.86	4.20	4.5	43.71	19.41	4.6	45.19	30.47
5.5	6.99	54.46	5.5	15.48	56.33	5.5	55.48	4.50	5.5	44.49	19.72	5.6	45.23	30.80
6.5	6.81	54.72	6.5	15.51	56.68	6.5	55.16	4.78	6.5	45.15	20.04	6.6	45.27	31.11
7.5	6.66	54.99	7.5	15.48	57.02	7.5	54.90	5.08	7.5	45.67	20.36	7.6	45.30	31.41
8.5	6.51	55.26	8.5	15.43	57.36	8.5	54.68	5.38	8.5	46.07	20.68	8.6	45.35	31.70
9.5	6.37	55.55	9.5	15.34	57.66	9.5	54.50	5.70	9.5	46.34	20.96	9.6	45.40	32.02
10.4	6.23	55.86	10.5	15.24	57.95	10.5	54.34	6.04	10.5	46.54	21.24	10.6	45.47	32.36
11.4	6.06	56.19	11.5	15.14	58.20	11.5	54.12	6.41	11.5	46.73	21.51	11.6	45.52	32.73
12.4	5.87	56.55	12.4	15.07	58.44	12.5	53.84	6.79	12.5	46.96	21.75	12.6	45.58	33.11
13.4	5.66	56.89	13.4	15.03	58.69	13.5	53.47	7.17	13.5	47.26	22.00	13.6	45.63	33.51
14.4	5.43	57.22	14.4	14.99	58.94	14.5	53.01	7.54	14.5	47.61	22.24	14.6	45.67	33.90
15.4	5.18	57.52	15.4	14.98	59.11	15.5	52.48	7.89	15.5	48.02	22.52	15.6	45.70	34.30
16.4	4.93	57.81	16.4	14.95	59.50	16.5	51.89	8.23	16.5	48.44	22.80	16.5	45.71	34.68
17.4	4.68	58.08	17.4	14.90	59.81	17.5	51.29	8.54	17.5	48.83	23.11	17.5	45.73	35.05
18.4	4.43	58.32	18.4	14.83	60.13	18.5	50.72	8.83	18.5	49.15	23.42	18.5	45.75	35.39
19.4	4.19	58.56	19.4	14.72	60.45	19.5	50.15	9.12	19.5	49.39	23.74	19.5	45.76	35.73
20.4	3.96	58.79	20.4	14.58	60.77	20.5	49.63	9.41	20.5	49.53	24.07	20.5	45.77	36.06
21.4	3.74	59.04	21.4	14.40	61.08	21.5	49.14	9.69	21.5	49.57	24.41	21.5	45.77	36.39
22.4	3.52	59.29	22.4	14.20	61.37	22.5	48.66	9.99	22.5	49.51	24.73	22.5	45.79	36.71
23.4	3.30	59.56	23.4	13.97	61.66	23.5	48.20	10.29	23.5	49.39	25.06	23.5	45.80	37.04
24.4	3.08	59.84	24.4	13.73	61.91	24.5	47.73	10.61	24.5	49.22	25.35	24.5	45.83	37.39
25.4	2.85	60.12	25.4	13.51	62.16	25.5	47.23	10.93	25.5	49.01	25.64	25.5	45.86	37.76
26.4	2.59	60.42	26.4	13.30	62.39	26.4	46.69	11.27	26.5	48.81	25.91	26.5	45.87	38.14
27.4	2.32	60.71	27.4	13.10	62.62	27.4	46.07	11.62	27.5	48.65	26.18	27.5	45.88	38.52
28.4	2.03	61.01	28.4	12.92	62.84	28.4	45.36	11.97	28.5	48.57	26.42	28.5	45.89	38.94
29.4	1.71	61.28	29.4	12.78	63.06	29.4	44.56	12.30	29.5	48.54	26.68	29.5	45.89	39.35
30.4	1.38	61.53	30.4	12.65	63.32	30.4	43.69	12.63	30.5	48.58	26.96	30.5	45.88	39.76
31.4	1.04	61.76	31.4	12.51	63.60	31.4	42.76	12.92	31.5	48.65	27.25	31.5	45.84	40.14
32.4	0.70	61.97	32.4	12.34	63.88	32.4	41.82	13.21	32.5	48.67	27.56	32.5	45.82	40.51
16.94	+16.91		24.56	-24.54		58.40	+58.39		73.73	-73.73		7.39	+7.33	
17 ^h 59 ^m	1°.307		18 ^h 6 ^m	11°.893		19 ^h 2 ^m	39°.624		19 ^h 27 ^m	42°.218		20 ^h 48 ^m	40°.494	
+86° 36'	51''.17		-87° 39'	51''.82		+89° 1'	2''.17		-89° 13'	28''.57		+82° 13'	29''.86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
July	21 38	-83 5	July	22 16	-86 22	July	22 37	-81 48	July	23 27	+86 50	July	23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.6	35.98	39.32	1.7	32.50	55.73	1.7	49.57	29.24	1.7	49.76	56.01	1.7	22.28	11.73
2.6	36.15	39.44	2.6	32.82	55.79	2.7	49.73	29.27	2.7	50.13	56.23	2.7	22.45	11.67
3.6	36.32	39.56	3.6	33.14	55.88	3.7	49.88	29.30	3.7	50.46	56.45	3.7	22.62	11.64
4.6	36.49	39.70	4.6	33.49	55.97	4.7	50.05	29.35	4.7	50.80	56.68	4.7	22.81	11.60
5.6	36.67	39.86	5.6	33.86	56.10	5.7	50.23	29.43	5.7	51.11	56.90	5.7	23.00	11.58
6.6	36.84	40.04	6.6	34.19	56.23	6.7	50.39	29.51	6.7	51.39	57.11	6.7	23.20	11.58
7.6	36.98	40.25	7.6	34.52	56.40	7.6	50.54	29.65	7.7	51.68	57.29	7.7	23.38	11.61
8.6	37.13	40.47	8.6	34.80	56.58	8.6	50.68	29.80	8.7	52.00	57.47	8.7	23.55	11.66
9.6	37.25	40.70	9.6	35.08	56.76	9.6	50.80	29.96	9.7	52.33	57.64	9.7	23.69	11.73
10.6	37.36	40.89	10.6	35.31	56.94	10.6	50.92	30.11	10.7	52.69	57.82	10.7	23.84	11.79
11.6	37.45	41.09	11.6	35.53	57.09	11.6	51.03	30.25	11.7	53.06	58.04	11.7	23.98	11.86
12.6	37.56	41.27	12.6	35.75	57.24	12.6	51.13	30.38	12.7	53.45	58.26	12.7	24.11	11.91
13.6	37.68	41.44	13.6	35.98	57.39	13.6	51.25	30.50	13.7	53.83	58.50	13.7	24.26	11.96
14.6	37.80	41.61	14.6	36.22	57.54	14.6	51.38	30.59	14.7	54.18	58.77	14.7	24.40	11.97
15.6	37.93	41.77	15.6	36.49	57.68	15.6	51.51	30.70	15.7	54.52	59.05	15.7	24.54	12.00
16.6	38.07	41.95	16.6	36.77	57.84	16.6	51.65	30.82	16.7	54.81	59.32	16.7	24.72	12.04
17.6	38.21	42.17	17.6	37.05	58.01	17.6	51.79	30.94	17.7	55.10	59.60	17.7	24.89	12.10
18.6	38.34	42.39	18.6	37.34	58.19	18.6	51.93	31.09	18.7	55.38	59.87	18.7	25.07	12.15
19.6	38.47	42.63	19.6	37.62	58.41	19.6	52.07	31.27	19.7	55.63	60.12	19.7	25.24	12.24
20.6	38.59	42.88	20.6	37.89	58.63	20.6	52.20	31.47	20.6	55.88	60.36	20.7	25.40	12.36
21.6	38.69	43.15	21.6	38.12	58.86	21.6	52.32	31.67	21.6	56.14	60.60	21.7	25.56	12.49
22.6	38.78	43.41	22.6	38.35	59.11	22.6	52.43	31.87	22.6	56.41	60.84	22.7	25.71	12.62
23.6	38.87	43.66	23.6	38.54	59.36	23.6	52.53	32.10	23.6	56.70	61.08	23.7	25.85	12.77
24.6	38.95	43.92	24.6	38.73	59.60	24.6	52.63	32.32	24.6	57.00	61.34	24.7	25.99	12.91
25.6	39.02	44.16	25.6	38.91	59.83	25.6	52.72	32.52	25.6	57.31	61.60	25.6	26.11	13.06
26.6	39.09	44.40	26.6	39.07	60.06	26.6	52.80	32.72	26.6	57.62	61.86	26.6	26.23	13.20
27.6	39.16	44.63	27.6	39.23	60.25	27.6	52.88	32.91	27.6	57.94	62.14	27.6	26.36	13.33
28.6	39.23	44.84	28.6	39.40	60.46	28.6	52.98	33.07	28.6	58.23	62.46	28.6	26.48	13.47
29.5	39.31	45.04	29.6	39.59	60.66	29.6	53.08	33.25	29.6	58.52	62.80	29.6	26.60	13.55
30.5	39.41	45.25	30.6	39.80	60.86	30.6	53.18	33.42	30.6	58.79	63.16	30.6	26.75	13.64
31.5	39.51	45.47	31.6	40.03	61.07	31.6	53.31	33.59	31.6	59.02	63.50	31.6	26.89	13.75
32.5	39.62	45.73	32.6	40.27	61.29	32.6	53.44	33.78	32.6	59.21	63.84	32.6	27.07	13.87
8.32	-8.26		15.85	-15.82		7.02	-6.95		18.20	+18.17		7.63	-7.56	
21 ^h 38 ^m	19 ^s .642		22 ^h 16 ^m	8 ^s .956		22 ^h 37 ^m	39 ^s .016		23 ^h 27 ^m	44 ^s .125		23 ^h 47 ^m	16 ^s .424	
-83° 6'	6'' .99		-86° 23'	27'' .13		-81° 49'	2'' .34		+86° 50'	58'' .89		-82° 28'	48'' .42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

48 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Aug.	h m s "	° ' "	Aug.	h m s "	° ' "	Aug.	h m s "	° ' "	Aug.	h m s "	° ' "	Aug.	h m s "	° ' "
0.7	22.05	45.97	0.7	51.98	42.35	0.7	2.68	43.97	0.8	11.49	2.96	0.9	18.83	20.71
1.7	22.30	46.22	1.7	53.01	42.56	1.7	2.95	43.95	1.8	11.80	2.93	1.9	19.11	20.56
2.7	22.55	46.47	2.7	53.96	42.76	2.7	3.22	43.95	2.8	12.09	2.92	2.9	19.36	20.42
3.7	22.78	46.70	3.7	54.89	42.96	3.7	3.49	43.98	3.8	12.36	2.89	3.9	19.60	20.27
4.7	23.01	46.90	4.7	55.82	43.11	4.7	3.76	44.02	4.8	12.63	2.85	4.9	19.83	20.12
5.7	23.25	47.10	5.7	56.79	43.26	5.7	4.01	44.10	5.8	12.90	2.80	5.9	20.05	19.94
6.7	23.52	47.31	6.7	57.84	43.41	6.7	4.25	44.18	6.8	13.17	2.72	6.9	20.27	19.76
7.7	23.80	47.51	7.7	58.94	43.56	7.7	4.47	44.26	7.8	13.46	2.64	7.9	20.50	19.54
8.7	24.09	47.74	8.7	60.12	43.73	8.7	4.67	44.35	8.8	13.78	2.54	8.9	20.76	19.32
9.7	24.40	47.97	9.7	61.31	43.92	9.7	4.88	44.44	9.8	14.11	2.47	9.8	21.03	19.12
10.7	24.70	48.23	10.7	62.49	44.14	10.7	5.08	44.50	10.8	14.45	2.41	10.8	21.33	18.92
11.6	24.98	48.51	11.7	63.63	44.38	11.7	5.30	44.56	11.8	14.80	2.39	11.8	21.64	18.74
12.6	25.25	48.81	12.7	64.69	44.62	12.7	5.52	44.61	12.8	15.14	2.39	12.8	21.94	18.60
13.6	25.49	49.10	13.7	65.69	44.88	13.7	5.75	44.67	13.8	15.47	2.41	13.8	22.23	18.47
14.6	25.72	49.40	14.7	66.62	45.13	14.7	6.00	44.75	14.8	15.79	2.44	14.8	22.52	18.37
15.6	25.92	49.69	15.7	67.50	45.38	15.7	6.25	44.83	15.8	16.07	2.47	15.8	22.80	18.27
16.6	26.12	49.96	16.7	68.35	45.63	16.7	6.51	44.95	16.8	16.36	2.50	16.8	23.06	18.17
17.6	26.32	50.23	17.7	69.20	45.85	17.7	6.76	45.08	17.8	16.64	2.53	17.8	23.31	18.07
18.6	26.53	50.48	18.7	70.04	46.05	18.7	7.00	45.22	18.8	16.92	2.54	18.8	23.56	17.95
19.6	26.75	50.74	19.7	70.93	46.25	19.7	7.23	45.36	19.8	17.20	2.53	19.8	23.81	17.83
20.6	26.97	51.01	20.6	71.87	46.46	20.7	7.46	45.53	20.8	17.48	2.52	20.8	24.06	17.69
21.6	27.20	51.27	21.6	72.83	46.68	21.7	7.66	45.72	21.8	17.78	2.51	21.8	24.33	17.55
22.6	27.44	51.53	22.6	73.83	46.91	22.7	7.85	45.90	22.8	18.09	2.49	22.8	24.60	17.42
23.6	27.69	51.81	23.6	74.86	47.16	23.6	8.03	46.07	23.8	18.42	2.48	23.8	24.89	17.27
24.6	27.93	52.12	24.6	75.90	47.42	24.6	8.22	46.23	24.7	18.75	2.48	24.8	25.20	17.14
25.6	28.18	52.44	25.6	76.93	47.71	25.6	8.40	46.38	25.7	19.09	2.52	25.8	25.52	17.04
26.6	28.42	52.79	26.6	77.91	48.02	26.6	8.59	46.50	26.7	19.46	2.58	26.8	25.86	16.98
27.6	28.63	53.14	27.6	78.82	48.34	27.6	8.79	46.63	27.7	19.80	2.67	27.8	26.20	16.86
28.6	28.82	53.49	28.6	79.65	48.68	28.6	9.00	46.76	28.7	20.14	2.78	28.8	26.52	16.81
29.6	28.99	53.84	29.6	80.40	48.99	29.6	9.23	46.90	29.7	20.46	2.89	29.8	26.84	16.78
30.6	29.14	54.18	30.6	81.11	49.29	30.6	9.45	47.06	30.7	20.75	2.99	30.8	27.13	16.75
31.6	29.29	54.52	31.6	81.79	49.58	31.6	9.67	47.24	31.7	21.08	3.09	31.8	27.41	16.71
13.70	+13.66		50.38	+50.37		11.90	-11.86		12.29	+12.25		11.84	+11.80	
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m 5 45	° ' -84 49	Aug.	h m 6 46	° ' -80 43	Aug.	h m 7 2	° ' +87 10	Aug.	h m 7 13	° ' +82 34	Aug.	h m 7 15	° ' -86 53
	s "	"		s "	"		s "	"		s "	"		s "	"
0.9	52.55	31.22	0.9	46.32	31.63	0.9	6.99	44.14	0.9	44.88	19.99	0.9	37.27	65.39
1.9	52.67	30.94	1.9	46.36	31.32	1.9	7.33	43.87	1.9	45.02	19.72	1.9	37.31	65.07
2.9	52.80	30.65	2.9	46.41	31.00	2.9	7.67	43.62	2.9	45.14	19.48	2.9	37.39	64.74
3.9	52.95	30.35	3.9	46.46	30.66	3.9	7.95	43.39	3.9	45.24	19.23	3.9	37.48	64.39
4.9	53.12	30.08	4.9	46.52	30.35	4.9	8.22	43.13	4.9	45.34	18.97	4.9	37.61	64.07
5.9	53.29	29.84	5.9	46.59	30.06	5.9	8.47	42.86	5.9	45.44	18.71	5.9	37.77	63.77
6.9	53.46	29.63	6.9	46.67	29.80	6.9	8.72	42.58	6.9	45.52	18.42	6.9	37.94	63.49
7.9	53.64	29.43	7.9	46.74	29.55	7.9	8.99	42.28	7.9	45.62	18.11	7.9	38.12	63.24
8.9	53.81	29.26	8.9	46.81	29.31	8.9	9.30	41.97	8.9	45.73	17.80	8.9	38.28	63.00
9.9	53.96	29.08	9.9	46.88	29.09	9.9	9.62	41.64	9.9	45.86	17.48	9.9	38.43	62.76
10.9	54.09	28.89	10.9	46.95	28.86	10.9	9.98	41.32	10.9	45.99	17.16	10.9	38.57	62.51
11.9	54.24	28.71	11.9	47.02	28.61	11.9	10.37	41.02	11.9	46.14	16.86	11.9	38.70	62.25
12.8	54.39	28.50	12.9	47.08	28.35	12.9	10.78	40.75	12.9	46.29	16.59	12.9	38.83	62.00
13.8	54.56	28.27	13.9	47.15	28.07	13.9	11.18	40.51	13.9	46.44	16.34	13.9	38.97	61.72
14.8	54.73	28.04	14.9	47.22	27.79	14.9	11.57	40.28	14.9	46.60	16.10	14.9	39.13	61.42
15.8	54.90	27.80	15.9	47.30	27.51	15.9	11.94	40.06	15.9	46.74	15.88	15.9	39.30	61.11
16.8	55.09	27.58	16.9	47.38	27.22	16.9	12.30	39.85	16.9	46.88	15.66	16.9	39.49	60.80
17.8	55.30	27.37	17.9	47.47	26.94	17.9	12.64	39.63	17.9	47.01	15.43	17.9	39.71	60.51
18.8	55.50	27.17	18.9	47.57	26.68	18.9	12.98	39.41	18.9	47.13	15.20	18.9	39.93	60.23
19.8	55.72	26.99	19.9	47.67	26.43	19.9	13.31	39.16	19.9	47.25	14.96	19.9	40.18	59.97
20.8	55.94	26.84	20.9	47.77	26.21	20.9	13.64	38.92	20.9	47.37	14.71	20.9	40.43	59.72
21.8	56.14	26.71	21.9	47.87	26.00	21.9	13.98	38.66	21.9	47.50	14.44	21.9	40.70	59.49
22.8	56.35	26.58	22.9	47.97	25.80	22.9	14.34	38.39	22.9	47.63	14.18	22.9	40.97	59.27
23.8	56.56	26.47	23.9	48.06	25.60	23.9	14.72	38.13	23.9	47.77	13.91	23.9	41.22	59.07
24.8	56.75	26.36	24.9	48.16	25.42	24.9	15.14	37.87	24.9	47.93	13.63	24.9	41.46	58.89
25.8	56.94	26.24	25.9	48.25	25.24	25.9	15.60	37.61	25.9	48.10	13.38	25.9	41.69	58.69
26.8	57.12	26.10	26.9	48.34	25.06	26.9	16.07	37.37	26.9	48.27	13.14	26.9	41.90	58.48
27.8	57.30	25.96	27.8	48.43	24.85	27.9	16.56	37.16	27.9	48.46	12.91	27.9	42.11	58.25
28.8	57.49	25.79	28.8	48.53	24.63	28.9	17.04	36.97	28.9	48.65	12.71	28.9	42.32	58.02
29.8	57.70	25.62	29.8	48.62	24.40	29.9	17.52	36.78	29.9	48.83	12.52	29.9	42.55	57.76
30.8	57.92	25.47	30.8	48.73	24.17	30.9	17.97	36.61	30.9	49.01	12.35	30.9	42.82	57.52
31.8	58.15	25.32	31.8	48.84	23.95	31.8	18.39	36.45	31.9	49.16	12.18	31.9	43.10	57.26
11.09	-11.04		6.20	-6.12		20.31	+20.28		7.73	+7.67		18.49	-18.47	
5 ^h 46 ^m	14°.756		6 ^h 46 ^m	58°.546		7 ^h 2 ^m	4°.048		7 ^h 13 ^m	42°.294		7 ^h 16 ^m	20°.292	
-84° 49'	46''.89		-80° 43'	38''.16		+87° 10'	54''.74		+82° 34'	30''.13		-86° 54'	6''.70	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			♄ Ootantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			♄ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m 8 15	° ' +88 52	Aug.	h m 9 8	° ' -85 20	Aug.	h m 9 25	° ' +81 41	Aug.	h m 9 36	° ' -80 34	Aug.	h m 10 21	° ' +82 58
	s	"		s	"		s	"		s	"		s	"
0.9	39.83	50.08	1.0	33.50	13.66	1.0	21.67	33.31	1.0	12.65	26.43	1.1	3.20	47.51
1.9	40.35	49.76	2.0	33.40	13.36	2.0	21.70	32.97	2.0	12.60	26.13	2.1	3.20	47.18
2.9	40.83	49.45	3.0	33.31	13.04	3.0	21.73	32.64	3.0	12.54	25.81	3.1	3.18	46.85
3.9	41.26	49.14	4.0	33.25	12.70	4.0	21.74	32.34	4.0	12.50	25.48	4.1	3.15	46.54
4.9	41.62	48.83	5.0	33.20	12.35	5.0	21.75	32.04	5.0	12.46	25.15	5.1	3.12	46.24
5.9	41.94	48.52	6.0	33.18	12.04	6.0	21.74	31.74	6.0	12.44	24.82	6.1	3.07	45.94
6.9	42.21	48.19	7.0	33.18	11.72	7.0	21.74	31.40	7.0	12.43	24.51	7.1	3.01	45.63
7.9	42.51	47.83	8.0	33.18	11.42	8.0	21.73	31.04	8.0	12.43	24.22	8.1	2.95	45.29
8.9	42.86	47.46	8.9	33.19	11.13	9.0	21.73	30.67	9.0	12.42	23.94	9.0	2.90	44.92
9.9	43.29	47.07	9.9	33.19	10.86	10.0	21.74	30.28	10.0	12.42	23.67	10.0	2.86	44.53
10.9	43.81	46.69	10.9	33.20	10.60	11.0	21.77	29.89	11.0	12.41	23.42	11.0	2.84	44.14
11.9	44.40	46.32	11.9	33.19	10.34	12.0	21.81	29.50	12.0	12.39	23.15	12.0	2.83	43.75
12.9	45.04	45.98	12.9	33.16	10.07	12.9	21.86	29.14	13.0	12.38	22.88	13.0	2.82	43.37
13.9	45.71	45.64	13.9	33.13	9.75	13.9	21.91	28.79	14.0	12.36	22.56	14.0	2.83	43.00
14.9	46.38	45.33	14.9	33.11	9.45	14.9	21.96	28.45	15.0	12.34	22.26	15.0	2.85	42.65
15.9	47.03	45.02	15.9	33.10	9.12	15.9	22.01	28.11	15.9	12.32	21.94	16.0	2.86	42.32
16.9	47.65	44.73	16.9	33.11	8.78	16.9	22.05	27.79	16.9	12.31	21.59	17.0	2.86	41.98
17.9	48.23	44.45	17.9	33.12	8.44	17.9	22.09	27.48	17.9	12.30	21.26	18.0	2.86	41.66
18.9	48.79	44.16	18.9	33.15	8.11	18.9	22.13	27.16	18.9	12.30	20.91	19.0	2.86	41.34
19.9	49.31	43.85	19.9	33.19	7.77	19.9	22.15	26.84	19.9	12.30	20.57	20.0	2.85	41.02
20.9	49.83	43.55	20.9	33.25	7.45	20.9	22.18	26.51	20.9	12.32	20.23	21.0	2.83	40.69
21.9	50.36	43.24	21.9	33.32	7.14	21.9	22.21	26.17	21.9	12.34	19.91	22.0	2.81	40.33
22.9	50.92	42.90	22.9	33.40	6.85	22.9	22.24	25.81	22.9	12.37	19.62	23.0	2.79	39.97
23.9	51.54	42.56	23.9	33.48	6.57	23.9	22.27	25.44	23.9	12.40	19.34	24.0	2.78	39.59
24.9	52.24	42.21	24.9	33.54	6.31	24.9	22.31	25.07	24.9	12.43	19.07	25.0	2.78	39.21
25.9	53.01	41.88	25.9	33.60	6.05	25.9	22.38	24.68	25.9	12.46	18.80	26.0	2.81	38.79
26.9	53.88	41.54	26.9	33.65	5.79	26.9	22.46	24.29	26.9	12.47	18.53	26.9	2.84	38.39
27.9	54.80	41.22	27.9	33.69	5.52	27.9	22.55	23.93	27.9	12.48	18.26	27.9	2.89	38.00
28.9	55.75	40.94	28.9	33.73	5.21	28.9	22.64	23.58	28.9	12.49	17.95	28.9	2.95	37.61
29.9	56.68	40.67	29.9	33.77	4.90	29.9	22.73	23.24	29.9	12.49	17.63	29.9	3.00	37.24
30.9	57.57	40.41	30.9	33.82	4.58	30.9	22.82	22.93	30.9	12.51	17.31	30.9	3.05	36.90
31.9	58.38	40.14	31.9	33.91	4.26	31.9	22.89	22.62	31.9	12.54	16.97	31.9	3.10	36.57
51.12	+51.11	12.30 -12.26	6.92	+6.85	6.11	-6.02	8.18	+8.12						
9 ^h 15 ^m 48 ^s .380	9 ^h 8 ^m 57 ^s .938	9 ^h 25 ^m 21 ^s .719	9 ^h 36 ^m 22 ^s .347	10 ^h 21 ^m 4 ^s .831										
+88° 53' 0".29	-85° 19' 57".45	+81° 41' 41".50	-80° 34' 6".83	+82° 58' 54".07										

APPARENT PLACES OF STARS, 1917.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 4.3			Bradley 1673. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelopard. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "
	10 59	-84 9		12 13	+88 9		12 46	-84 40		12 48	+83 51		13 27	-85 22
1.1	43.94	20.27	1.1	69.23	33.87	1.2	5.80	58.57	1.2	26.55	50.16	1.2	18.06	19.03
2.1	43.80	20.06	2.1	68.82	33.59	2.2	5.58	58.49	2.2	26.41	49.91	2.2	17.81	19.00
3.1	43.65	19.82	3.1	68.42	33.34	3.2	5.36	58.39	3.2	26.28	49.68	3.2	17.54	18.95
4.1	43.50	19.55	4.1	68.01	33.09	4.2	5.13	58.25	4.2	26.13	49.47	4.2	17.27	18.87
5.1	43.36	19.28	5.1	67.57	32.85	5.2	4.92	58.09	5.2	25.99	49.28	5.2	17.02	18.77
6.1	43.26	19.00	6.1	67.10	32.61	6.2	4.73	57.92	6.2	25.81	49.10	6.2	16.77	18.65
7.1	43.16	18.72	7.1	66.58	32.38	7.2	4.56	57.75	7.2	25.64	48.90	7.2	16.54	18.51
8.1	43.07	18.46	8.1	66.02	32.12	8.2	4.40	57.59	8.2	25.45	48.68	8.2	16.33	18.38
9.1	43.01	18.23	9.1	65.46	31.84	9.1	4.25	57.41	9.2	25.27	48.45	9.2	16.14	18.27
10.1	42.93	18.00	10.1	64.93	31.53	10.1	4.11	57.26	10.1	25.09	48.20	10.2	15.96	18.17
11.1	42.85	17.77	11.1	64.41	31.22	11.1	3.97	57.12	11.1	24.92	47.93	11.2	15.77	18.08
12.1	42.77	17.55	12.1	63.95	30.89	12.1	3.81	57.00	12.1	24.76	47.65	12.2	15.58	17.99
13.1	42.68	17.32	13.1	63.54	30.55	13.1	3.64	56.86	13.1	24.62	47.36	13.2	15.37	17.90
14.1	42.57	17.06	14.1	63.17	30.23	14.1	3.46	56.72	14.1	24.48	47.07	14.2	15.15	17.81
15.1	42.47	16.79	15.1	62.83	29.91	15.1	3.28	56.56	15.1	24.35	46.78	15.2	14.91	17.70
16.1	42.37	16.52	16.1	62.50	29.60	16.1	3.09	56.38	16.1	24.24	46.52	16.2	14.67	17.57
17.1	42.26	16.22	17.1	62.17	29.31	17.1	2.89	56.19	17.1	24.12	46.25	17.2	14.42	17.42
18.1	42.17	15.90	18.1	61.84	29.02	18.1	2.70	55.97	18.1	23.99	46.00	18.2	14.18	17.25
19.0	42.10	15.58	19.1	61.49	28.72	19.1	2.52	55.73	19.1	23.86	45.75	19.2	13.94	17.06
20.0	42.04	15.26	20.1	61.11	28.45	20.1	2.36	55.48	20.1	23.72	45.51	20.1	13.71	16.86
21.0	41.97	14.94	21.1	60.70	28.16	21.1	2.21	55.24	21.1	23.57	45.26	21.1	13.51	16.66
22.0	41.93	14.63	22.1	60.28	27.86	22.1	2.07	55.00	22.1	23.43	45.00	22.1	13.32	16.45
23.0	41.89	14.34	23.1	59.86	27.54	23.1	1.95	54.75	23.1	23.28	44.72	23.1	13.14	16.24
24.0	41.87	14.06	24.1	59.43	27.20	24.1	1.84	54.52	24.1	23.12	44.42	24.1	12.99	16.05
25.0	41.84	13.79	25.1	59.02	26.84	25.1	1.73	54.31	25.1	22.97	44.10	25.1	12.83	15.89
26.0	41.81	13.55	26.1	58.66	26.48	26.1	1.62	54.11	26.1	22.83	43.76	26.1	12.66	15.74
27.0	41.77	13.31	27.1	58.34	26.09	27.1	1.49	53.93	27.1	22.72	43.41	27.1	12.49	15.59
28.0	41.72	13.04	28.1	58.08	25.69	28.1	1.36	53.75	28.1	22.61	43.06	28.1	12.32	15.44
29.0	41.66	12.75	29.1	57.85	25.31	29.1	1.22	53.52	29.1	22.52	42.72	29.1	12.13	15.27
30.0	41.60	12.44	30.1	57.66	24.94	30.1	1.06	53.30	30.1	22.44	42.37	30.1	11.91	15.08
31.0	41.54	12.12	31.1	57.48	24.61	31.1	0.90	53.06	31.1	22.35	42.05	31.1	11.69	14.88
32.0	41.50	11.79	32.1	57.27	24.27	32.1	0.75	52.79	32.1	22.26	41.73	32.1	11.49	14.66
9.82 -9.77			31.12 +31.10			10.79 -10.74			9.35 +9.30			12.39 -12.35		
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2333. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursa Minoris. Mag. 4.4			δ G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m 14 13	° ' -83 17	Aug.	h m 15 3	° ' +87 33	Aug.	h m 15 24	° ' -84 12	Aug.	h m 16 54	° ' +82 10	Aug.	h m 17 16	° ' -80 47
	s "	"		s "	"		s "	"		s "	"		s "	"
1.2	35.28	56.67	1.3	29.26	16.12	1.3	11.88	1.94	1.3	25.58	42.50	1.4	10.90	25.20
2.2	35.12	56.73	2.3	28.73	16.05	2.3	11.70	2.07	2.3	25.42	42.61	2.4	10.82	25.45
3.2	34.94	56.72	3.3	28.23	15.98	3.3	11.50	2.18	3.3	25.28	42.70	3.4	10.75	25.69
4.2	34.75	56.69	4.3	27.74	15.94	4.3	11.30	2.28	4.3	25.13	42.82	4.4	10.66	25.92
5.2	34.56	56.67	5.3	27.23	15.91	5.3	11.08	2.34	5.3	24.99	42.96	5.3	10.56	26.11
6.2	34.39	56.61	6.3	26.72	15.90	6.3	10.88	2.38	6.3	24.84	43.11	6.3	10.45	26.28
7.2	34.22	56.52	7.3	26.16	15.89	7.3	10.69	2.38	7.3	24.69	43.27	7.3	10.36	26.42
8.2	34.08	56.43	8.2	25.59	15.88	8.3	10.51	2.38	8.3	24.52	43.45	8.3	10.26	26.55
9.2	33.93	56.37	9.2	24.99	15.85	9.3	10.34	2.38	9.3	24.36	43.63	9.3	10.17	26.67
10.2	33.79	56.32	10.2	24.37	15.81	10.3	10.18	2.41	10.3	24.19	43.77	10.3	10.09	26.79
11.2	33.66	56.27	11.2	23.76	15.72	11.3	10.03	2.45	11.3	24.00	43.90	11.3	10.02	26.93
12.2	33.53	56.22	12.2	23.16	15.63	12.3	9.88	2.50	12.3	23.83	44.01	12.3	9.95	27.11
13.2	33.39	56.18	13.2	22.58	15.53	13.2	9.70	2.54	13.3	23.65	44.11	13.3	9.87	27.27
14.2	33.22	56.15	14.2	22.03	15.41	14.2	9.52	2.58	14.3	23.49	44.19	14.3	9.79	27.45
15.2	33.05	56.11	15.2	21.51	15.29	15.2	9.32	2.63	15.3	23.32	44.24	15.3	9.69	27.63
16.2	32.87	56.02	16.2	21.00	15.18	16.2	9.13	2.66	16.3	23.15	44.29	16.3	9.59	27.81
17.2	32.70	55.95	17.2	20.51	15.08	17.2	8.90	2.67	17.3	23.00	44.35	17.3	9.48	27.95
18.2	32.51	55.82	18.2	20.01	14.98	18.2	8.68	2.67	18.3	22.85	44.41	18.3	9.35	28.10
19.2	32.32	55.70	19.2	19.51	14.89	19.2	8.46	2.65	19.3	22.68	44.49	19.3	9.22	28.23
20.2	32.16	55.57	20.2	19.01	14.81	20.2	8.25	2.61	20.3	22.51	44.57	20.3	9.10	28.33
21.2	32.01	55.42	21.2	18.48	14.72	21.2	8.05	2.55	21.3	22.35	44.66	21.3	8.97	28.42
22.2	31.86	55.25	22.2	17.93	14.65	22.2	7.85	2.50	22.3	22.18	44.76	22.3	8.85	28.50
23.2	31.72	55.09	23.2	17.35	14.57	23.2	7.66	2.43	23.3	22.01	44.86	23.3	8.75	28.56
24.2	31.59	54.94	24.2	16.76	14.46	24.2	7.49	2.36	24.3	21.82	44.95	24.3	8.64	28.62
25.2	31.45	54.80	25.2	16.16	14.32	25.2	7.33	2.29	25.3	21.64	45.01	25.3	8.54	28.69
26.2	31.34	54.69	26.2	15.57	14.17	26.2	7.17	2.26	26.3	21.45	45.06	26.3	8.46	28.77
27.2	31.21	54.59	27.2	15.00	13.98	27.2	7.01	2.24	27.3	21.26	45.08	27.3	8.37	28.86
28.2	31.07	54.47	28.2	14.44	13.79	28.2	6.84	2.22	28.3	21.07	45.08	28.3	8.27	28.99
29.2	30.92	54.38	29.2	13.93	13.58	29.2	6.67	2.19	29.3	20.89	45.06	29.3	8.18	29.11
30.2	30.76	54.24	30.2	13.45	13.38	30.2	6.46	2.15	30.3	20.71	45.03	30.3	8.05	29.21
31.2	30.60	54.11	31.2	12.98	13.18	31.2	6.24	2.10	31.3	20.54	45.00	31.3	7.93	29.32
32.1	30.43	53.95	32.2	12.52	13.00	32.2	6.02	2.01	32.3	20.37	45.00	32.3	7.80	29.39
8.57	-8.51		23.48	+23.41		9.90	-9.85		7.35	+7.28		6.25	-6.17	
14 ^h 13 ^m 27 ^s .793			15 ^h 3 ^m 41 ^s .175			15 ^h 23 ^m 56 ^s .594			16 ^h 54 ^m 25 ^s .488			17 ^h 15 ^m 54 ^s .896		
-83° 17' 21 ^{''} .03			+87° 33' 10 ^{''} .52			-84° 11' 30 ^{''} .39			+82° 10' 32 ^{''} .75			-80° 47' 6 ^{''} .56		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '	Aug.	h m	° '
	17 58	+86 37		18 7	-87 40		19 2	+89 1		19 30	-89 13		20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
1.4	60.70	1.97	1.4	12.34	3.88	1.4	41.82	13.21	1.5	48.67	27.56	1.5	45.82	40.51
2.4	60.37	2.17	2.4	12.14	4.17	2.4	40.92	13.48	2.4	48.61	27.88	2.5	45.78	40.85
3.4	60.06	2.36	3.4	11.90	4.47	3.4	40.06	13.72	3.4	48.42	28.21	3.5	45.75	41.18
4.4	59.77	2.55	4.4	11.62	4.76	4.4	39.28	13.99	4.4	48.09	28.54	4.5	45.72	41.51
5.4	59.49	2.77	5.4	11.29	5.01	5.4	38.54	14.25	5.4	47.65	28.84	5.5	45.70	41.83
6.4	59.21	2.99	6.4	10.95	5.25	6.4	37.82	14.52	6.4	47.09	29.13	6.5	45.69	42.19
7.4	58.90	3.23	7.4	10.61	5.44	7.4	37.09	14.84	7.4	46.51	29.40	7.5	45.67	42.55
8.4	58.59	3.47	8.4	10.28	5.64	8.4	36.32	15.16	8.4	45.93	29.65	8.5	45.66	42.93
9.4	58.27	3.73	9.4	10.00	5.82	9.4	35.44	15.49	9.4	45.43	29.89	9.5	45.65	43.33
10.4	57.90	3.97	10.4	9.72	6.00	10.4	34.49	15.81	10.4	44.98	30.13	10.5	45.61	43.74
11.4	57.53	4.21	11.4	9.47	6.20	11.4	33.46	16.10	11.4	44.59	30.38	11.5	45.57	44.15
12.4	57.16	4.41	12.4	9.21	6.42	12.4	32.37	16.40	12.4	44.22	30.65	12.5	45.53	44.54
13.4	56.77	4.58	13.4	8.94	6.66	13.4	31.26	16.66	13.4	43.85	30.93	13.5	45.47	44.91
14.4	56.40	4.74	14.4	8.64	6.89	14.4	30.17	16.89	14.4	43.42	31.22	14.5	45.41	45.26
15.4	56.03	4.89	15.4	8.32	7.13	15.4	29.08	17.12	15.4	42.92	31.52	15.5	45.35	45.60
16.3	55.68	5.03	16.4	7.96	7.38	16.4	28.05	17.34	16.4	42.32	31.82	16.5	45.29	45.93
17.3	55.34	5.18	17.4	7.58	7.61	17.4	27.05	17.57	17.4	41.62	32.12	17.5	45.23	46.23
18.3	55.01	5.33	18.3	7.16	7.82	18.4	26.08	17.80	18.4	40.82	32.42	18.5	45.17	46.55
19.3	54.67	5.50	19.3	6.72	8.02	19.4	25.14	18.04	19.4	39.95	32.69	19.5	45.11	46.88
20.3	54.33	5.68	20.3	6.28	8.20	20.4	24.20	18.28	20.4	39.02	32.95	20.5	45.06	47.22
21.3	54.00	5.87	21.3	5.84	8.35	21.4	23.23	18.55	21.4	38.05	33.19	21.5	45.01	47.57
22.3	53.63	6.06	22.3	5.40	8.50	22.4	22.24	18.83	22.4	37.10	33.42	22.4	44.96	47.93
23.3	53.27	6.24	23.3	4.98	8.66	23.4	21.19	19.10	23.4	36.15	33.66	23.4	44.91	48.29
24.3	52.87	6.43	24.3	4.59	8.79	24.4	20.06	19.37	24.4	35.28	33.85	24.4	44.86	48.68
25.3	52.46	6.61	25.3	4.22	8.90	25.4	18.84	19.64	25.4	34.46	34.04	25.4	44.78	49.06
26.3	52.03	6.76	26.3	3.88	9.05	26.4	17.55	19.89	26.4	33.72	34.26	26.4	44.70	49.45
27.3	51.60	6.90	27.3	3.55	9.20	27.4	16.21	20.12	27.4	33.03	34.48	27.4	44.61	49.82
28.3	51.17	7.00	28.3	3.19	9.38	28.4	14.85	20.31	28.4	32.33	34.72	28.4	44.51	50.15
29.3	50.74	7.08	29.3	2.82	9.56	29.4	13.48	20.51	29.4	31.57	35.00	29.4	44.41	50.48
30.3	50.33	7.14	30.3	2.41	9.74	30.4	12.19	20.68	30.4	30.71	35.26	30.4	44.31	50.79
31.3	49.94	7.22	31.3	1.94	9.91	31.3	10.95	20.85	31.4	29.71	35.52	31.4	44.21	51.06
32.3	49.56	7.31	32.3	1.45	10.06	32.3	9.78	21.02	32.4	28.60	35.77	32.4	44.12	51.37
16.95	+16.92		24.58	-24.56		58.55	+58.54		73.97	-73.97		7.40	+7.33	
17 ^h 59 ^m	1° 30'		18 ^h 6 ^m	11° 89'		19 ^h 2 ^m	39° 62'		19 ^h 27 ^m	42° 218'		20 ^h 48 ^m	40° 494'	
+86° 36'	51'' 17		-87° 39'	51'' 82		+89° 1'	2'' 17		-89° 13'	28'' 57		+82° 13'	29'' 86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Aug.	21 38	-83 5	Aug.	22 16	-86 23	Aug.	22 37	-81 48	Aug.	23 27	+86 51	Aug.	23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.5	39.62	45.73	1.6	40.27	1.29	1.6	53.44	33.78	1.6	59.21	3.84	1.6	27.07	13.87
2.5	39.72	45.99	2.6	40.49	1.53	2.6	53.54	34.00	2.6	59.39	4.16	2.6	27.22	14.01
3.5	39.82	46.27	3.6	40.70	1.80	3.6	53.65	34.24	3.6	59.58	4.46	3.6	27.37	14.18
4.5	39.88	46.59	4.6	40.89	2.07	4.6	53.75	34.51	4.6	59.76	4.75	4.6	27.51	14.37
5.5	39.93	46.90	5.6	41.03	2.36	5.6	53.83	34.77	5.6	59.97	5.04	5.6	27.64	14.59
6.5	39.97	47.19	6.6	41.14	2.65	6.6	53.89	35.03	6.6	60.20	5.33	6.6	27.75	14.80
7.5	39.99	47.47	7.6	41.24	2.94	7.6	53.95	35.29	7.6	60.45	5.63	7.6	27.85	14.99
8.5	40.02	47.75	8.5	41.33	3.18	8.6	54.00	35.53	8.6	60.72	5.95	8.6	27.94	15.20
9.5	40.05	47.98	9.5	41.42	3.43	9.6	54.06	35.75	9.6	60.97	6.31	9.6	28.03	15.38
10.5	40.08	48.21	10.5	41.53	3.66	10.6	54.12	35.98	10.6	61.22	6.67	10.6	28.13	15.57
11.5	40.13	48.44	11.5	41.65	3.89	11.6	54.20	36.19	11.6	61.45	7.04	11.6	28.23	15.74
12.5	40.18	48.68	12.5	41.79	4.12	12.6	54.28	36.40	12.6	61.63	7.42	12.6	28.36	15.89
13.5	40.24	48.96	13.5	41.93	4.39	13.5	54.36	36.63	13.6	61.80	7.80	13.6	28.48	16.06
14.5	40.29	49.24	14.5	42.08	4.67	14.5	54.44	36.88	14.6	61.94	8.15	14.6	28.61	16.27
15.5	40.34	49.54	15.5	42.22	4.95	15.5	54.52	37.15	15.6	62.07	8.51	15.6	28.73	16.48
16.5	40.39	49.86	16.5	42.34	5.26	16.5	54.59	37.44	16.6	62.20	8.84	16.6	28.85	16.70
17.5	40.41	50.19	17.5	42.44	5.58	17.5	54.64	37.75	17.6	62.32	9.16	17.6	28.95	16.96
18.5	40.42	50.52	18.5	42.53	5.91	18.5	54.69	38.06	18.6	62.45	9.49	18.6	29.06	17.22
19.5	40.43	50.83	19.5	42.57	6.25	19.5	54.74	38.37	19.6	62.59	9.80	19.6	29.15	17.49
20.5	40.42	51.14	20.5	42.61	6.57	20.5	54.77	38.68	20.6	62.75	10.13	20.6	29.23	17.77
21.5	40.40	51.44	21.5	42.63	6.88	21.5	54.80	38.97	21.6	62.92	10.45	21.6	29.31	18.04
22.5	40.38	51.73	22.5	42.64	7.16	22.5	54.82	39.25	22.6	63.09	10.80	22.6	29.37	18.31
23.5	40.36	52.00	23.5	42.65	7.45	23.5	54.84	39.53	23.6	63.27	11.16	23.6	29.43	18.57
24.5	40.34	52.26	24.5	42.65	7.72	24.5	54.87	39.78	24.6	63.45	11.54	24.6	29.49	18.81
25.5	40.34	52.52	25.5	42.69	7.98	25.5	54.89	40.08	25.6	63.59	11.94	25.6	29.57	19.03
26.5	40.34	52.77	26.5	42.72	8.22	26.5	54.93	40.27	26.6	63.72	12.34	26.6	29.64	19.24
27.5	40.35	53.03	27.5	42.78	8.49	27.5	54.96	40.51	27.5	63.81	12.76	27.6	29.72	19.46
28.5	40.37	53.31	28.5	42.86	8.76	28.5	55.01	40.78	28.5	63.87	13.18	28.6	29.81	19.69
29.5	40.38	53.60	29.5	42.92	9.06	29.5	55.06	41.06	29.5	63.93	13.57	29.6	29.91	19.94
30.5	40.39	53.92	30.5	42.97	9.37	30.5	55.10	41.38	30.5	63.96	13.94	30.6	30.01	20.21
31.5	40.36	54.23	31.5	42.99	9.70	31.5	55.13	41.69	31.5	63.99	14.30	31.5	30.09	20.49
32.5	40.33	54.55	32.5	43.00	10.03	32.5	55.14	42.02	32.5	64.04	14.66	32.5	30.14	20.81
8.32	-8.26		15.86	-15.83		7.02	-6.95		18.21	+18.18		7.63	-7.56	
21 ^h 38 ^m	19°.542		22 ^h 16 ^m	8°.656		22 ^h 37 ^m	39°.016		23 ^h 27 ^m	44°.125		23 ^h 47 ^m	16°.424	
-83° 6'	6''.99		-86° 23'	27''.13		-81° 49'	2''.34		+86° 50'	58''.89		-82° 28'	48''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursae Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Sept.	h m s	° ' "	Sept.	h m s	° ' "	Sept.	h m s	° ' "	Sept.	h m s	° ' "	Sept.	h m s	° ' "
0 57	0 57	+85 48	1 31	1 31	+88 51	1 42	1 42	-85 10	4 10	4 10	+85 20	5 35	5 35	+85 9
0.6	29.29	54.52	0.6	21.79	49.58	0.6	9.67	47.24	0.7	21.03	3.09	0.8	27.41	16.71
1.6	29.44	54.82	1.6	22.51	49.86	1.6	9.87	47.47	1.7	21.31	3.17	1.8	27.68	16.67
2.6	29.62	55.11	2.6	23.28	50.12	2.6	10.06	47.70	2.7	21.59	3.23	2.8	27.95	16.61
3.6	29.81	55.42	3.6	24.11	50.38	3.6	10.24	47.95	3.7	21.90	3.28	3.8	28.23	16.53
4.6	30.01	55.73	4.6	25.00	50.66	4.6	10.39	48.19	4.7	22.21	3.32	4.8	28.51	16.43
5.6	30.24	56.05	5.6	25.94	50.94	5.6	10.52	48.42	5.7	22.54	3.36	5.8	28.84	16.33
6.6	30.44	56.41	6.6	26.85	51.26	6.6	10.66	48.65	6.7	22.88	3.44	6.8	29.16	16.24
7.6	30.65	56.77	7.6	27.74	51.57	7.6	10.80	48.85	7.7	23.22	3.53	7.8	29.50	16.19
8.6	30.83	57.15	8.6	28.56	51.92	8.6	10.96	49.06	8.7	23.57	3.65	8.8	29.85	16.17
9.6	30.99	57.53	9.6	29.30	52.28	9.6	11.13	49.25	9.7	23.91	3.78	9.8	30.19	16.16
10.6	31.13	57.90	10.6	29.97	52.65	10.6	11.30	49.45	10.7	24.22	3.93	10.8	30.52	16.16
11.6	31.25	58.27	11.6	30.57	53.00	11.6	11.47	49.66	11.7	24.51	4.09	11.8	30.81	16.17
12.6	31.36	58.64	12.6	31.12	53.34	12.6	11.65	49.90	12.7	24.81	4.24	12.8	31.11	16.20
13.6	31.46	58.98	13.6	31.68	53.67	13.6	11.83	50.16	13.7	25.08	4.39	13.8	31.40	16.21
14.6	31.57	59.32	14.6	32.22	53.98	14.6	11.98	50.43	14.7	25.35	4.53	14.8	31.68	16.22
15.6	31.67	59.65	15.6	32.78	54.30	15.6	12.14	50.72	15.7	25.61	4.67	15.7	31.96	16.23
16.6	31.80	59.97	16.6	33.37	54.58	16.6	12.28	51.01	16.7	25.88	4.78	16.7	32.23	16.20
17.5	31.93	60.30	17.6	34.00	54.86	17.6	12.41	51.31	17.7	26.16	4.89	17.7	32.51	16.17
18.5	32.06	60.64	18.6	34.65	55.17	18.6	12.51	51.61	18.7	26.45	4.99	18.7	32.81	16.16
19.5	32.20	60.98	19.6	35.35	55.49	19.6	12.61	51.91	19.7	26.75	5.12	19.7	33.12	16.14
20.5	32.35	61.35	20.6	36.06	55.83	20.6	12.71	52.19	20.7	27.06	5.24	20.7	33.44	16.13
21.5	32.50	61.72	21.6	36.77	56.19	21.6	12.79	52.48	21.7	27.38	5.38	21.7	33.77	16.11
22.5	32.64	62.13	22.6	37.41	56.56	22.6	12.88	52.73	22.7	27.72	5.56	22.7	34.11	16.14
23.5	32.75	62.54	23.6	38.00	56.97	23.6	12.98	52.97	23.7	28.05	5.75	23.7	34.46	16.19
24.5	32.84	62.95	24.6	38.51	57.39	24.6	13.08	53.21	24.7	28.35	5.98	24.7	34.80	16.27
25.5	32.90	63.36	25.6	38.95	57.78	25.6	13.21	53.46	25.7	28.64	6.20	25.7	35.14	16.36
26.5	32.96	63.75	26.5	39.29	58.16	26.6	13.33	53.73	26.7	28.93	6.42	26.7	35.46	16.45
27.5	33.00	64.13	27.5	39.62	58.53	27.6	13.46	54.00	27.7	29.17	6.65	27.7	35.74	16.54
28.5	33.04	64.50	28.5	39.95	58.87	28.5	13.56	54.30	28.7	29.42	6.85	28.7	36.03	16.62
29.5	33.10	64.84	29.5	40.33	59.22	29.5	13.66	54.63	29.7	29.66	7.04	29.7	36.29	16.68
30.5	33.17	65.18	30.5	40.77	59.54	30.5	13.73	54.95	30.6	29.93	7.21	30.7	36.57	16.72
31.5	33.26	65.54	31.5	41.26	59.86	31.5	13.78	55.29	31.6	30.19	7.37	31.7	36.85	16.75
13.71	+13.67		50.49	+50.48		11.90	-11.86		12.29	+12.25		11.84	+11.80	
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensae. Mag. 6.2			ζ Mensae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelopardalis. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	5 45	-84 49		6 46	-80 43		7 2	+87 10		7 13	+82 34		7 15	-86 53
	s	"		s	"		s	"		s	"		s	"
0.8	58.15	25.32	0.8	48.84	23.95	0.8	18.39	36.45	0.9	49.16	12.18	0.9	43.10	57.26
1.8	58.38	25.21	1.8	48.96	23.75	1.8	18.79	36.27	1.9	49.31	11.99	1.9	43.41	57.02
2.8	58.62	25.10	2.8	49.08	23.58	2.8	19.18	36.07	2.9	49.46	11.79	2.9	43.74	56.82
3.8	58.86	25.05	3.8	49.20	23.44	3.8	19.58	35.86	3.8	49.61	11.57	3.9	44.08	56.63
4.8	59.09	25.00	4.8	49.32	23.33	4.8	20.00	35.65	4.8	49.76	11.33	4.8	44.41	56.48
5.8	59.31	24.97	5.8	49.45	23.22	5.8	20.45	35.42	5.8	49.98	11.09	5.8	44.73	56.34
6.8	59.51	24.93	6.8	49.56	23.11	6.8	20.93	35.20	6.8	50.12	10.84	6.8	45.03	56.21
7.8	59.72	24.89	7.8	49.67	22.99	7.8	21.43	34.99	7.8	50.30	10.61	7.8	45.32	56.07
8.8	59.93	24.83	8.8	49.77	22.86	8.8	21.95	34.79	8.8	50.50	10.41	8.8	45.61	55.91
9.8	60.13	24.75	9.8	49.88	22.72	9.8	22.47	34.63	9.8	50.71	10.24	9.8	45.89	55.74
10.8	60.36	24.67	10.8	50.00	22.56	10.8	22.99	34.48	10.8	50.91	10.09	10.8	46.19	55.56
11.8	60.58	24.58	11.8	50.13	22.39	11.8	23.49	34.35	11.8	51.10	9.94	11.8	46.50	55.37
12.8	60.82	24.49	12.8	50.25	22.23	12.8	23.97	34.23	12.8	51.28	9.80	12.8	46.82	55.18
13.8	61.07	24.43	13.8	50.38	22.08	13.8	24.43	34.11	13.8	51.45	9.67	13.8	47.18	55.00
14.8	61.32	24.38	14.8	50.50	21.94	14.8	24.88	33.99	14.8	51.63	9.54	14.8	47.54	54.83
15.8	61.57	24.37	15.8	50.64	21.83	15.8	25.32	33.86	15.8	51.79	9.40	15.8	47.92	54.67
16.8	61.82	24.35	16.8	50.78	21.73	16.8	25.76	33.73	16.8	51.95	9.24	16.8	48.31	54.52
17.8	62.08	24.36	17.8	50.92	21.66	17.8	26.20	33.58	17.8	52.12	9.07	17.8	48.70	54.41
18.7	62.33	24.40	18.8	51.05	21.60	18.8	26.65	33.43	18.8	52.29	8.90	18.8	49.10	54.31
19.7	62.57	24.44	19.8	51.19	21.57	19.8	27.12	33.27	19.8	52.46	8.72	19.8	49.49	54.22
20.7	62.80	24.48	20.8	51.32	21.54	20.8	27.61	33.11	20.8	52.65	8.54	20.8	49.86	54.16
21.7	63.02	24.52	21.8	51.46	21.50	21.8	28.15	32.95	21.8	52.85	8.37	21.8	50.21	54.09
22.7	63.23	24.56	22.8	51.58	21.46	22.8	28.70	32.81	22.8	53.06	8.21	22.8	50.55	54.01
23.7	63.45	24.59	23.8	51.70	21.41	23.8	29.27	32.70	23.8	53.28	8.07	23.8	50.88	53.93
24.7	63.66	24.60	24.8	51.83	21.34	24.8	29.85	32.61	24.8	53.51	7.97	24.8	51.21	53.84
25.7	63.88	24.60	25.8	51.95	21.26	25.8	30.41	32.55	25.8	53.73	7.88	25.8	51.54	53.72
26.7	64.11	24.60	26.8	52.07	21.18	26.8	30.94	32.50	26.8	53.93	7.81	26.8	51.90	53.61
27.7	64.35	24.61	27.8	52.21	21.12	27.8	31.46	32.45	27.8	54.13	7.74	27.8	52.28	53.50
28.7	64.61	24.65	28.8	52.34	21.07	28.8	31.93	32.39	28.8	54.31	7.67	28.8	52.69	53.40
29.7	64.86	24.72	29.8	52.49	21.05	29.8	32.40	32.32	29.8	54.49	7.58	29.8	53.10	53.35
30.7	65.11	24.81	30.8	52.63	21.06	30.8	32.86	32.24	30.8	54.66	7.47	30.8	53.54	53.30
31.7	65.35	24.94	31.8	52.78	21.10	31.8	33.35	32.13	31.8	54.84	7.35	31.8	53.97	53.30
11.08	-11.04		6.20	-6.12		20.30	+20.27		7.73	+7.67		18.48	-18.45	
5 ^h 46 ^m 14 ^s .756			6 ^h 46 ^m 58 ^s .546			7 ^h 2 ^m 4 ^s .048			7 ^h 13 ^m 42 ^s .294			7 ^h 16 ^m 20 ^s .292		
-84° 49' 46".89			-80° 43' 38".16			+87° 10' 54".74			+82° 34' 30".13			-86° 54' 6".70		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119 Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m ° ' "		Sept.	h m ° ' "		Sept.	h m ° ' "		Sept.	h m ° ' "		Sept.	h m ° ' "	
	8 15 +88 52			9 8 -85 19			9 25 +81 41			9 36 -80 34			10 21 +82 58	
	s " "			s " "			s " "			s " "			s " "	
0.9	58.38 40.14	0.9	33.91 64.26	0.9	22.89 22.62	0.9	12.54 16.97	0.9	3.10 36.57					
1.9	59.13 39.87	1.9	34.00 63.95	1.9	22.95 22.31	1.9	12.57 16.64	1.9	3.13 36.24					
2.9	59.85 39.59	2.9	34.12 63.63	2.9	23.00 22.00	2.9	12.62 16.33	2.9	3.15 35.87					
3.9	60.56 39.29	3.9	34.25 63.35	3.9	23.05 21.67	3.9	12.67 16.04	3.9	3.16 35.52					
4.9	61.30 38.98	4.9	34.39 63.09	4.9	23.11 21.30	4.9	12.73 15.76	4.9	3.17 35.15					
5.9	62.11 38.66	5.9	34.53 62.85	5.9	23.18 20.93	5.9	12.78 15.49	5.9	3.19 34.74					
6.9	63.01 38.33	6.9	34.65 62.63	6.9	23.26 20.55	6.9	12.84 15.25	6.9	3.23 34.33					
7.9	63.97 38.04	7.9	34.77 62.41	7.9	23.36 20.17	7.9	12.89 15.01	7.9	3.28 33.93					
8.9	65.00 37.74	8.9	34.87 62.18	8.9	23.45 19.80	8.9	12.94 14.74	8.9	3.35 33.52					
9.9	66.06 37.46	9.9	34.98 61.90	9.9	23.56 19.47	9.9	12.99 14.46	9.9	3.43 33.14					
10.9	67.13 37.20	10.9	35.09 61.64	10.9	23.67 19.15	10.9	13.03 14.19	10.9	3.52 32.76					
11.9	68.16 36.96	11.9	35.19 61.35	11.9	23.78 18.83	11.9	13.08 13.91	11.9	3.60 32.41					
12.9	69.18 36.74	12.9	35.32 61.06	12.9	23.88 18.54	12.9	13.12 13.61	12.9	3.68 32.07					
13.9	70.15 36.52	13.9	35.46 60.76	13.9	23.98 18.26	13.9	13.18 13.30	13.9	3.75 31.76					
14.9	71.08 36.29	14.9	35.61 60.46	14.9	24.07 17.98	14.9	13.23 13.00	14.9	3.81 31.43					
15.9	71.99 36.07	15.9	35.78 60.18	15.9	24.16 17.68	15.9	13.31 12.68	15.9	3.87 31.11					
16.9	72.87 35.83	16.9	35.96 59.90	16.9	24.24 17.38	16.9	13.39 12.39	16.9	3.93 30.78					
17.9	73.75 35.60	17.9	36.14 59.66	17.9	24.33 17.07	17.9	13.47 12.10	17.9	3.98 30.43					
18.9	74.66 35.35	18.9	36.34 59.42	18.9	24.41 16.75	18.9	13.55 11.84	18.9	4.04 30.07					
19.8	75.60 35.09	19.9	36.54 59.21	19.9	24.50 16.42	19.9	13.64 11.60	19.9	4.10 29.70					
20.8	76.61 34.81	20.9	36.73 59.01	20.9	24.60 16.09	20.9	13.72 11.36	20.9	4.17 29.34					
21.8	77.70 34.54	21.9	36.91 58.82	21.9	24.71 15.74	21.9	13.81 11.14	21.9	4.25 28.94					
22.8	78.85 34.29	22.9	37.08 58.62	22.9	24.84 15.39	22.9	13.90 10.93	22.9	4.35 28.55					
23.8	80.07 34.05	23.9	37.25 58.43	23.9	24.98 15.06	23.9	13.98 10.73	23.9	4.46 28.16					
24.8	81.34 33.84	24.9	37.41 58.22	24.9	25.12 14.76	24.9	14.05 10.51	24.9	4.58 27.79					
25.8	82.59 33.65	25.9	37.57 58.00	25.9	25.26 14.48	25.9	14.12 10.29	25.9	4.71 27.44					
26.8	83.82 33.47	26.9	37.73 57.76	26.9	25.40 14.20	26.9	14.20 10.05	26.9	4.84 27.11					
27.8	84.96 33.30	27.9	37.91 57.52	27.9	25.54 13.93	27.9	14.27 9.79	27.9	4.95 26.79					
28.8	86.05 33.14	28.9	38.11 57.29	28.9	25.65 13.67	28.9	14.36 9.52	28.9	5.05 26.49					
29.8	87.07 32.96	29.9	38.34 57.08	29.9	25.75 13.41	29.9	14.46 9.28	29.9	5.15 26.18					
30.8	88.08 32.77	30.9	38.57 56.89	30.9	25.86 13.14	30.9	14.57 9.04	30.9	5.23 25.86					
31.8	89.09 32.55	31.9	38.81 56.70	31.9	25.97 12.86	31.9	14.68 8.83	31.9	5.31 25.52					
51.01	+51.00	12.29	-12.25	6.92	+6.84	6.10	-6.02	8.18	+8.12					
8 ^h 15 ^m 48 ^s .380		9 ^h 8 ^m 57 ^s .938		9 ^h 25 ^m 21 ^s .719		9 ^h 36 ^m 22 ^s .847		10 ^h 21 ^m 4 ^s .831						
+88° 53' 0".29		-85° 19' 57".45		+81° 41' 41".50		-80° 34' 6".83		+82° 58' 54".07						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1679. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
10 59	-84 9	12 13	+88 9	12 45	-84 40	12 48	+83 51	13 27	-85 22					
1.0	41.50	11.79	1.1	57.27	24.27	1.1	60.75	52.79	1.1	22.26	41.73	1.1	11.49	14.66
2.0	41.46	11.46	2.1	57.04	23.94	2.1	60.61	52.51	2.1	22.16	41.44	2.1	11.30	14.42
3.0	41.46	11.12	3.1	56.75	23.63	3.1	60.50	52.22	3.1	22.03	41.14	3.1	11.13	14.14
4.0	41.48	10.80	4.1	56.42	23.29	4.1	60.41	51.93	4.1	21.91	40.83	4.1	10.98	13.87
5.0	41.49	10.50	5.1	56.09	22.94	5.1	60.34	51.65	5.1	21.79	40.51	5.1	10.85	13.63
5.9	41.51	10.21	6.1	55.76	22.57	6.1	60.28	51.39	6.1	21.67	40.17	6.1	10.75	13.40
6.9	41.54	9.93	7.0	55.47	22.18	7.1	60.21	51.14	7.1	21.56	39.81	7.1	10.64	13.17
7.9	41.56	9.66	8.0	55.23	21.78	8.1	60.13	50.90	8.1	21.45	39.43	8.1	10.51	12.94
8.9	41.56	9.38	9.0	55.03	21.37	9.1	60.05	50.67	9.1	21.36	39.05	9.1	10.38	12.72
9.9	41.56	9.10	10.0	54.89	20.97	10.1	59.96	50.42	10.1	21.28	38.66	10.1	10.24	12.51
10.9	41.56	8.82	11.0	54.77	20.58	11.1	59.86	50.15	11.1	21.22	38.29	11.1	10.09	12.29
11.9	41.56	8.51	12.0	54.68	20.21	12.1	59.76	49.88	12.1	21.17	37.93	12.1	9.93	12.04
12.9	41.55	8.17	13.0	54.60	19.85	13.1	59.65	49.59	13.1	21.11	37.59	13.1	9.77	11.78
13.9	41.55	7.84	14.0	54.51	19.49	14.1	59.55	49.27	14.1	21.05	37.25	14.1	9.61	11.50
14.9	41.58	7.49	15.0	54.41	19.15	15.0	59.46	48.96	15.0	20.99	36.91	15.1	9.46	11.21
15.9	41.62	7.15	16.0	54.28	18.81	16.0	59.38	48.64	16.0	20.92	36.58	16.1	9.32	10.91
16.9	41.66	6.82	17.0	54.13	18.47	17.0	59.32	48.29	17.0	20.84	36.27	17.1	9.21	10.59
17.9	41.71	6.49	18.0	53.97	18.11	18.0	59.28	47.95	18.0	20.75	35.95	18.1	9.10	10.27
18.9	41.78	6.17	19.0	53.79	17.74	19.0	59.25	47.62	19.0	20.67	35.61	19.1	9.00	9.96
19.9	41.86	5.87	20.0	53.61	17.37	20.0	59.23	47.30	20.0	20.59	35.24	20.1	8.94	9.67
20.9	41.94	5.59	21.0	53.46	16.98	21.0	59.21	47.01	21.0	20.51	34.86	21.1	8.88	9.37
21.9	42.00	5.31	22.0	53.33	16.57	22.0	59.20	46.73	22.0	20.45	34.47	22.1	8.83	9.09
22.9	42.07	5.06	23.0	53.25	16.16	23.0	59.19	46.46	23.0	20.39	34.07	23.1	8.77	8.85
23.9	42.14	4.81	24.0	53.22	15.72	24.0	59.15	46.21	24.0	20.35	33.65	24.1	8.69	8.61
24.9	42.19	4.54	24.9	53.25	15.28	25.0	59.11	45.95	25.0	20.32	33.23	25.0	8.60	8.37
25.9	42.23	4.26	25.9	53.29	14.87	26.0	59.07	45.67	26.0	20.31	32.82	26.0	8.51	8.10
26.9	42.28	3.98	26.9	53.38	14.49	27.0	59.02	45.34	27.0	20.30	32.44	27.0	8.41	7.82
27.9	42.34	3.65	27.9	53.44	14.12	28.0	58.97	45.03	28.0	20.29	32.07	28.0	8.31	7.50
28.9	42.41	3.33	28.9	53.49	13.75	29.0	58.94	44.70	29.0	20.26	31.71	29.0	8.21	7.17
29.9	42.50	3.01	29.9	53.48	13.42	30.0	58.93	44.35	30.0	20.23	31.37	30.0	8.16	6.83
30.9	42.60	2.69	30.9	53.44	13.06	31.0	58.94	43.99	31.0	20.19	31.02	31.0	8.12	6.47
31.9	42.74	2.41	31.9	53.39	12.70	32.0	58.97	43.65	32.0	20.14	30.66	32.0	8.11	6.12
9.81	-9.76	31.06	+31.05	10.79	-10.74	9.35	+9.30	12.39	-12.35					
10 ^h 59 ^m 55 ^s .280	12 ^h 14 ^m 28 ^s .425	12 ^h 46 ^m 7 ^s .152	12 ^h 48 ^m 30 ^s .418	13 ^h 27 ^m 14 ^s .624										
-84° 8' 50".60	+88° 9' 36".08	-84° 40' 22".34	+83° 51' 50".47	-85° 21' 42".23										

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			50 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	14 13	-83 17		15 2	+87 33		15 24	-84 11		16 54	+82 10		17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
1.1	30.43	53.95	1.2	72.52	13.00	1.2	6.02	62.01	1.3	20.37	45.00	1.3	7.80	29.39
2.1	30.28	53.73	2.2	72.05	12.86	2.2	5.83	61.91	2.3	20.20	45.03	2.3	7.67	29.44
3.1	30.14	53.51	3.2	71.54	12.71	3.2	5.62	61.77	3.3	20.03	45.05	3.3	7.53	29.45
4.1	30.01	53.29	4.2	71.01	12.58	4.2	5.43	61.63	4.3	19.85	45.08	4.3	7.40	29.45
5.1	29.89	53.08	5.2	70.45	12.41	5.2	5.27	61.48	5.2	19.67	45.12	5.3	7.28	29.44
6.1	29.79	52.87	6.2	69.88	12.25	6.2	5.12	61.33	6.2	19.47	45.15	6.3	7.17	29.43
7.1	29.69	52.68	7.2	69.31	12.06	7.2	4.97	61.22	7.2	19.29	45.15	7.3	7.07	29.44
8.1	29.60	52.50	8.2	68.76	11.85	8.2	4.82	61.11	8.2	19.09	45.12	8.3	6.97	29.45
9.1	29.48	52.32	9.2	68.23	11.61	9.2	4.67	61.01	9.2	18.90	45.08	9.3	6.86	29.48
10.1	29.36	52.14	10.2	67.72	11.35	10.2	4.50	60.91	10.2	18.70	45.03	10.2	6.76	29.52
11.1	29.24	51.96	11.2	67.26	11.09	11.2	4.32	60.81	11.2	18.52	44.94	11.2	6.64	29.55
12.1	29.10	51.78	12.2	66.81	10.85	12.2	4.14	60.68	12.2	18.35	44.87	12.2	6.51	29.58
13.1	28.97	51.56	13.1	66.39	10.62	13.2	3.94	60.55	13.2	18.18	44.79	13.2	6.38	29.60
14.1	28.82	51.33	14.1	65.97	10.39	14.2	3.75	60.40	14.2	18.01	44.72	14.2	6.24	29.61
15.1	28.68	51.08	15.1	65.54	10.16	15.2	3.55	60.23	15.2	17.84	44.66	15.2	6.10	29.60
16.1	28.56	50.82	16.1	65.11	9.94	16.2	3.35	60.06	16.2	17.68	44.60	16.2	5.96	29.58
17.1	28.45	50.54	17.1	64.66	9.75	17.2	3.17	59.85	17.2	17.51	44.55	17.2	5.82	29.53
18.1	28.35	50.25	18.1	64.21	9.53	18.1	3.00	59.63	18.2	17.33	44.50	18.2	5.68	29.45
19.1	28.25	49.95	19.1	63.73	9.32	19.1	2.85	59.41	19.2	17.15	44.46	19.2	5.54	29.37
20.1	28.17	49.67	20.1	63.23	9.10	20.1	2.70	59.19	20.2	16.98	44.42	20.2	5.42	29.28
21.1	28.09	49.42	21.1	62.73	8.88	21.1	2.56	58.97	21.2	16.79	44.37	21.2	5.32	29.20
22.1	28.04	49.16	22.1	62.24	8.61	22.1	2.44	58.78	22.2	16.60	44.29	22.2	5.22	29.12
23.1	27.96	48.94	23.1	61.76	8.31	23.1	2.32	58.60	23.2	16.41	44.17	23.2	5.12	29.05
24.1	27.88	48.72	24.1	61.30	8.00	24.1	2.19	58.44	24.2	16.22	44.03	24.2	5.02	29.00
25.1	27.81	48.51	25.1	60.88	7.69	25.1	2.05	58.27	25.2	16.04	43.88	25.2	4.92	28.97
26.1	27.72	48.27	26.1	60.49	7.38	26.1	1.91	58.11	26.2	15.87	43.72	26.2	4.80	28.94
27.1	27.62	48.03	27.1	60.12	7.07	27.1	1.74	57.92	27.2	15.69	43.57	27.2	4.67	28.90
28.1	27.52	47.75	28.1	59.77	6.79	28.1	1.57	57.71	28.2	15.52	43.41	28.2	4.54	28.84
29.1	27.41	47.42	29.1	59.42	6.51	29.1	1.40	57.49	29.2	15.38	43.27	29.2	4.40	28.75
30.1	27.33	47.12	30.1	59.05	6.28	30.1	1.26	57.23	30.2	15.21	43.16	30.2	4.27	28.63
31.1	27.27	46.80	31.1	58.66	6.01	31.1	1.12	56.95	31.2	15.05	43.06	31.2	4.14	28.48
32.1	27.22	46.47	32.1	58.24	5.76	32.1	1.01	56.67	32.2	14.88	42.96	32.2	4.02	28.31
8.57	-8.51	23.42	+23.40	9.90	-9.85	7.35	+7.28	6.25	-6.17					
14 ^h 13 ^m	27°.793	15 ^h 3 ^m	41°.175	15 ^h 23 ^m	56°.594	16 ^h 54 ^m	25°.488	17 ^h 15 ^m	54°.896					
-83° 17'	21''.03	+87° 33'	10''.52	-84° 11'	30''.39	+82° 10'	32''.75	-80° 47'	6''.56					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "	Sept.	h m	° ' "
	17 58	+86 37		18 6	-87 40		19 1	+89 1		19 29	-89 13		20 48	+82 13
	s	"		s	"		s	"		s	"		s	"
1.3	49.56	7.31	1.3	61.45	10.06	1.3	69.78	21.02	1.4	88.60	35.77	1.4	44.12	51.37
2.3	49.19	7.41	2.3	60.94	10.18	2.3	68.65	21.20	2.4	87.38	36.01	2.4	44.04	51.68
3.3	48.82	7.53	3.3	60.42	10.28	3.3	67.52	21.42	3.4	86.11	36.20	3.4	43.95	52.00
4.3	48.42	7.67	4.3	59.94	10.35	4.3	66.36	21.64	4.4	84.83	36.39	4.4	43.88	52.33
5.3	48.01	7.80	5.3	59.46	10.40	5.3	65.12	21.88	5.4	83.61	36.54	5.4	43.79	52.69
6.3	47.59	7.94	6.3	59.02	10.46	6.3	63.82	22.13	6.4	82.46	36.70	6.4	43.70	53.06
7.3	47.13	8.06	7.3	58.60	10.52	7.3	62.43	22.37	7.3	81.38	36.85	7.4	43.61	53.42
8.3	46.68	8.16	8.3	58.19	10.60	8.3	60.99	22.56	8.3	80.36	37.01	8.4	43.50	53.77
9.3	46.23	8.22	9.3	57.78	10.69	9.3	59.52	22.73	9.3	79.33	37.19	9.4	43.39	54.10
10.3	45.78	8.27	10.3	57.36	10.79	10.3	58.05	22.88	10.3	78.29	37.38	10.4	43.26	54.39
11.3	45.35	8.30	11.3	56.90	10.90	11.3	56.62	23.01	11.3	77.16	37.59	11.4	43.13	54.67
12.3	44.93	8.35	12.3	56.40	11.01	12.3	55.22	23.11	12.3	75.97	37.80	12.4	43.01	54.95
13.3	44.51	8.38	13.3	55.90	11.12	13.3	53.87	23.23	13.3	74.68	38.01	13.4	42.88	55.22
14.3	44.12	8.40	14.3	55.36	11.21	14.3	52.56	23.35	14.3	73.30	38.21	14.4	42.78	55.48
15.3	43.73	8.43	15.3	54.81	11.26	15.3	51.28	23.48	15.3	71.85	38.38	15.4	42.66	55.74
16.3	43.34	8.47	16.3	54.24	11.30	16.3	50.01	23.61	16.3	70.35	38.53	16.4	42.55	56.01
17.3	42.93	8.50	17.3	53.68	11.32	17.3	48.76	23.76	17.3	68.80	38.66	17.4	42.44	56.27
18.3	42.53	8.56	18.3	53.13	11.33	18.3	47.48	23.92	18.3	67.25	38.78	18.4	42.32	56.55
19.3	42.12	8.62	19.3	52.60	11.33	19.3	46.15	24.09	19.3	65.73	38.90	19.4	42.22	56.83
20.3	41.69	8.69	20.3	52.09	11.31	20.3	44.78	24.26	20.3	64.27	38.99	20.4	42.09	57.15
21.2	41.24	8.76	21.3	51.61	11.29	21.3	43.32	24.41	21.3	62.89	39.06	21.4	41.97	57.46
22.2	40.78	8.79	22.3	51.17	11.27	22.3	41.79	24.55	22.3	61.58	39.14	22.4	41.84	57.76
23.2	40.31	8.80	23.2	50.74	11.27	23.3	40.21	24.68	23.3	60.33	39.24	23.4	41.70	58.05
24.2	39.85	8.77	24.2	50.31	11.29	24.3	38.59	24.78	24.3	59.12	39.35	24.4	41.55	58.32
25.2	39.37	8.74	25.2	49.87	11.30	25.3	36.98	24.84	25.3	57.89	39.47	25.4	41.40	58.56
26.2	38.93	8.68	26.2	49.37	11.34	26.3	35.42	24.90	26.3	56.58	39.61	26.4	41.24	58.80
27.2	38.50	8.64	27.2	48.87	11.36	27.3	33.93	24.94	27.3	55.17	39.75	27.4	41.09	59.00
28.2	38.09	8.58	28.2	48.32	11.37	28.3	32.51	24.98	28.3	53.62	39.89	28.3	40.94	59.21
29.2	37.71	8.53	29.2	47.76	11.34	29.3	31.14	25.04	29.3	51.99	39.99	29.3	40.80	59.40
30.2	37.30	8.51	30.2	47.19	11.29	30.3	29.80	25.12	30.3	50.30	40.05	30.3	40.67	59.64
31.2	36.90	8.51	31.2	46.63	11.22	31.3	28.46	25.23	31.3	48.60	40.11	31.3	40.54	59.88
32.2	36.49	8.52	32.2	46.11	11.13	32.3	27.06	25.34	32.3	46.95	40.13	32.3	40.42	60.14
16.96	+16.93		24.59	-24.57		58.66	+58.65		74.15	-74.15		7.40	+7.33	
17 ^h 59 ^m	1° 30'		18 ^h 6 ^m 11 ^s .893			19 ^h 2 ^m 39 ^s .624			19 ^h 27 ^m 42 ^s .218			20 ^h 48 ^m 40 ^s .494		
+86° 36'	51'' 17		-87° 39'	51'' 82		+89° 1'	2'' 17		-89° 13'	28'' 57		+82° 13'	29'' 86	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m 21 38	° ' " -83 58	Sept.	h m 22 16	° ' " -86 23	Sept.	h m 22 37	° ' " -81 48	Sept.	h m 23 28	° ' " +86 51	Sept.	h m 23 47	° ' " -82 28
1.5	40.33	54.55	1.5	43.00	10.03	1.5	55.14	42.02	1.5	4.04	14.66	1.5	30.14	20.81
2.5	40.29	54.87	2.5	42.97	10.36	2.5	55.14	42.35	2.5	4.12	14.99	2.5	30.20	21.12
3.5	40.23	55.17	3.5	42.91	10.68	3.5	55.14	42.66	3.5	4.22	15.35	3.5	30.23	21.42
4.4	40.16	55.44	4.5	42.82	10.97	4.5	55.12	42.95	4.5	4.33	15.71	4.5	30.26	21.72
5.4	40.10	55.70	5.5	42.73	11.25	5.5	55.10	43.23	5.5	4.43	16.09	5.5	30.29	22.01
6.4	40.06	55.94	6.5	42.67	11.52	6.5	55.08	43.48	6.5	4.53	16.51	6.5	30.32	22.28
7.4	40.00	56.17	7.5	42.61	11.76	7.5	55.07	43.75	7.5	4.62	16.91	7.5	30.35	22.55
8.4	39.96	56.41	8.5	42.57	12.03	8.5	55.08	44.01	8.5	4.66	17.33	8.5	30.39	22.80
9.4	39.93	56.68	9.5	42.54	12.30	9.5	55.08	44.28	9.5	4.67	17.74	9.5	30.44	23.06
10.4	39.89	56.95	10.5	42.52	12.59	10.5	55.09	44.56	10.5	4.68	18.14	10.5	30.48	23.33
11.4	39.85	57.23	11.5	42.49	12.89	11.5	55.09	44.86	11.5	4.65	18.53	11.5	30.53	23.61
12.4	39.80	57.54	12.5	42.44	13.21	12.5	55.08	45.17	12.5	4.62	18.91	12.5	30.58	23.91
13.4	39.75	57.85	13.4	42.39	13.53	13.5	55.07	45.49	13.5	4.59	19.28	13.5	30.61	24.22
14.4	39.67	58.17	14.4	42.30	13.86	14.5	55.05	45.82	14.5	4.56	19.63	14.5	30.64	24.55
15.4	39.58	58.48	15.4	42.20	14.19	15.5	55.01	46.15	15.5	4.55	19.99	15.5	30.65	24.88
16.4	39.49	58.77	16.4	42.07	14.52	16.5	54.97	46.48	16.5	4.54	20.32	16.5	30.67	25.24
17.4	39.39	59.06	17.4	41.92	14.82	17.5	54.92	46.80	17.5	4.55	20.67	17.5	30.67	25.58
18.4	39.28	59.32	18.4	41.75	15.12	18.5	54.87	47.10	18.5	4.56	21.03	18.5	30.66	25.92
19.4	39.17	59.57	19.4	41.59	15.39	19.4	54.81	47.39	19.5	4.57	21.42	19.5	30.64	26.24
20.4	39.06	59.81	20.4	41.42	15.67	20.4	54.75	47.67	20.5	4.59	21.82	20.5	30.63	26.54
21.4	38.96	60.01	21.4	41.27	15.91	21.4	54.70	47.93	21.5	4.59	22.23	21.5	30.61	26.83
22.4	38.87	60.22	22.4	41.13	16.15	22.4	54.65	48.17	22.5	4.56	22.65	22.5	30.59	27.11
23.4	38.80	60.44	23.4	41.01	16.40	23.4	54.61	48.41	23.5	4.52	23.08	23.5	30.59	27.38
24.4	38.72	60.67	24.4	40.91	16.64	24.4	54.59	48.67	24.5	4.44	23.50	24.5	30.60	27.64
25.4	38.65	60.91	25.4	40.80	16.90	25.4	54.56	48.94	25.5	4.33	23.91	25.5	30.61	27.92
26.4	38.56	61.17	26.4	40.70	17.18	26.4	54.52	49.22	26.5	4.20	24.31	26.5	30.63	28.22
27.4	38.47	61.43	27.4	40.56	17.49	27.4	54.48	49.53	27.5	4.08	24.67	27.5	30.63	28.53
28.4	38.37	61.69	28.4	40.40	17.78	28.4	54.43	49.83	28.5	3.97	25.03	28.5	30.62	28.86
29.4	38.24	61.95	29.4	40.21	18.07	29.4	54.35	50.15	29.5	3.87	25.37	29.5	30.58	29.21
30.4	38.10	62.19	30.4	40.00	18.35	30.4	54.27	50.44	30.5	3.80	25.71	30.5	30.54	29.54
31.4	37.96	62.42	31.4	39.75	18.60	31.4	54.18	50.72	31.4	3.74	26.06	31.5	30.49	29.87
32.4	37.82	62.62	32.4	39.51	18.83	32.4	54.09	50.97	32.4	3.69	26.44	32.5	30.43	30.19
8.32	-8.26		15.87	-15.84		7.02	-6.95		18.23	+18.20		7.63	-7.57	
21 ^h 38 ^m	19 ^s .542		22 ^h 16 ^m	8 ^s .656		22 ^h 37 ^m	39 ^s .016		23 ^h 27 ^m	44 ^s .125		23 ^h 47 ^m	16 ^s .424	
-83° 6'	6''.99		-86° 23'	27''.13		-81° 49'	2''.34		+86° 50'	58''.89		-82° 28'	48''.42	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	0 57	+85 49		1 31	+88 51		1 42	-85 10		4 10	+85 20		5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.5	33.17	5.18	0.5	40.77	59.54	0.5	13.73	54.95	0.6	29.93	7.21	0.7	36.57	16.72
1.5	33.26	5.54	1.5	41.26	59.86	1.5	13.78	55.29	1.6	30.19	7.37	1.7	36.85	16.75
2.5	33.36	5.91	2.5	41.80	60.19	2.5	13.81	55.63	2.6	30.48	7.54	2.7	37.17	16.78
3.5	33.46	6.29	3.5	42.34	60.57	3.5	13.84	55.95	3.6	30.79	7.72	3.7	37.48	16.82
4.5	33.55	6.68	4.5	42.86	60.95	4.5	13.87	56.24	4.6	31.10	7.92	4.7	37.82	16.88
5.5	33.63	7.10	5.5	43.31	61.36	5.5	13.90	56.53	5.6	31.39	8.14	5.7	38.16	16.95
6.5	33.68	7.51	6.5	43.68	61.76	6.5	13.94	56.81	6.6	31.69	8.38	6.7	38.50	17.05
7.5	33.71	7.92	7.5	43.98	62.17	7.5	13.98	57.09	7.6	31.97	8.64	7.7	38.82	17.19
8.5	33.72	8.33	8.5	44.20	62.58	8.5	14.04	57.38	8.6	32.22	8.90	8.7	39.13	17.33
9.5	33.72	8.73	9.5	44.37	62.96	9.5	14.11	57.69	9.6	32.46	9.17	9.7	39.42	17.48
10.5	33.71	9.11	10.5	44.50	63.34	10.5	14.17	58.01	10.6	32.69	9.42	10.7	39.70	17.62
11.5	33.70	9.48	11.5	44.64	63.72	11.5	14.21	58.33	11.6	32.90	9.67	11.7	39.97	17.76
12.5	33.69	9.81	12.5	44.77	64.06	12.5	14.25	58.67	12.6	33.10	9.91	12.7	40.24	17.89
13.5	33.69	10.16	13.5	44.94	64.40	13.5	14.26	59.03	13.6	33.33	10.15	13.7	40.48	18.02
14.5	33.70	10.51	14.5	45.13	64.75	14.5	14.27	59.40	14.6	33.54	10.39	14.7	40.75	18.14
15.5	33.71	10.85	15.5	45.35	65.09	15.5	14.26	59.76	15.6	33.76	10.62	15.7	41.01	18.25
16.5	33.73	11.19	16.5	45.61	65.44	16.5	14.23	60.10	16.6	34.00	10.84	16.7	41.29	18.34
17.5	33.75	11.56	17.5	45.88	65.80	17.5	14.20	60.45	17.6	34.24	11.05	17.7	41.57	18.43
18.5	33.78	11.95	18.5	46.14	66.18	18.5	14.17	60.78	18.6	34.51	11.29	18.7	41.88	18.53
19.5	33.80	12.36	19.5	46.38	66.60	19.5	14.12	61.09	19.6	34.77	11.55	19.7	42.19	18.67
20.5	33.80	12.78	20.5	46.56	67.01	20.5	14.09	61.37	20.6	35.04	11.82	20.7	42.51	18.82
21.5	33.78	13.19	21.5	46.67	67.43	21.5	14.06	61.66	21.6	35.28	12.13	21.7	42.83	19.00
22.5	33.74	13.61	22.5	46.68	67.84	22.5	14.05	61.93	22.6	35.50	12.45	22.6	43.12	19.19
23.5	33.67	14.00	23.5	46.60	68.26	23.5	14.05	62.20	23.6	35.71	12.76	23.6	43.41	19.42
24.4	33.59	14.37	24.5	46.48	68.64	24.5	14.04	62.51	24.6	35.90	13.08	24.6	43.66	19.64
25.4	33.51	14.72	25.5	46.35	69.02	25.5	14.02	62.84	25.6	36.08	13.39	25.6	43.91	19.84
26.4	33.44	15.05	26.5	46.25	69.36	26.5	13.99	63.18	26.6	36.24	13.68	26.6	44.14	20.03
27.4	33.38	15.38	27.5	46.19	69.70	27.5	13.94	63.53	27.6	36.41	13.94	27.6	44.38	20.19
28.4	33.33	15.71	28.5	46.22	70.04	28.5	13.86	63.88	28.6	36.59	14.19	28.6	44.61	20.34
29.4	33.30	16.05	29.5	46.27	70.38	29.5	13.76	64.23	29.6	36.79	14.43	29.6	44.87	20.49
30.4	33.29	16.40	30.5	46.36	70.75	30.5	13.66	64.56	30.6	37.01	14.70	30.6	45.14	20.64
31.4	33.26	16.78	31.5	46.43	71.13	31.5	13.56	64.88	31.6	37.24	14.98	31.6	45.42	20.82
13.72 +13.68			50.62 +50.61			11.91 -11.87			12.30 +12.26			11.84 +11.80		
0 ^h 57 ^m 9 ^s .900			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			ζ Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m 5 46 s	° ' " -84 49 "	Oct.	h m 6 46 s	° ' " -80 43 "	Oct.	h m 7 2 s	° ' " +87 10 "	Oct.	h m 7 13 s	° ' " +82 34 "	Oct.	h m 7 15 s	° ' " -86 53 "
0.7	5.11	24.81	0.8	52.63	21.06	0.8	32.86	32.24	0.8	54.66	7.47	0.8	53.54	53.30
1.7	5.35	24.94	1.8	52.78	21.10	1.8	33.35	32.13	1.8	54.84	7.35	1.8	53.97	53.30
2.7	5.58	25.07	2.8	52.92	21.15	2.8	33.85	32.01	2.8	55.03	7.22	2.8	54.37	53.30
3.7	5.80	25.21	3.7	53.06	21.21	3.8	34.38	31.90	3.8	55.23	7.10	3.8	54.76	53.31
4.7	6.00	25.31	4.7	53.19	21.26	4.8	34.93	31.79	4.8	55.45	6.98	4.8	55.13	53.33
5.7	6.21	25.43	5.7	53.31	21.30	5.8	35.51	31.72	5.8	55.68	6.88	5.8	55.50	53.34
6.7	6.41	25.53	6.7	53.45	21.33	6.8	36.09	31.67	6.8	55.91	6.81	6.8	55.85	53.33
7.7	6.62	25.62	7.7	53.58	21.35	7.7	36.67	31.64	7.8	56.13	6.76	7.8	56.21	53.31
8.7	6.84	25.70	8.7	53.70	21.36	8.7	37.22	31.63	8.8	56.34	6.71	8.8	56.57	53.27
9.7	7.06	25.79	9.7	53.84	21.38	9.7	37.75	31.63	9.8	56.55	6.70	9.8	56.96	53.23
10.7	7.29	25.92	10.7	53.98	21.41	10.7	38.26	31.64	10.7	56.75	6.69	10.7	57.36	53.21
11.7	7.53	26.04	11.7	54.11	21.44	11.7	38.76	31.65	11.7	56.94	6.67	11.7	57.78	53.20
12.7	7.77	26.17	12.7	54.26	21.49	12.7	39.25	31.65	12.7	57.13	6.64	12.7	58.21	53.19
13.7	8.00	26.31	13.7	54.40	21.56	13.7	39.72	31.64	13.7	57.30	6.61	13.7	58.64	53.23
14.7	8.23	26.48	14.7	54.55	21.64	14.7	40.18	31.62	14.7	57.49	6.58	14.7	59.08	53.27
15.7	8.46	26.68	15.7	54.69	21.75	15.7	40.66	31.60	15.7	57.67	6.54	15.7	59.51	53.33
16.7	8.68	26.89	16.7	54.83	21.88	16.7	41.15	31.57	16.7	57.85	6.49	16.7	59.93	53.41
17.7	8.88	27.10	17.7	54.97	22.02	17.7	41.66	31.53	17.7	58.05	6.43	17.7	60.35	53.51
18.7	9.08	27.31	18.7	55.10	22.17	18.7	42.20	31.51	18.7	58.27	6.37	18.7	60.73	53.61
19.7	9.26	27.50	19.7	55.22	22.31	19.7	42.76	31.50	19.7	58.49	6.34	19.7	61.10	53.72
20.7	9.44	27.70	20.7	55.35	22.44	20.7	43.35	31.50	20.7	58.71	6.32	20.7	61.46	53.80
21.7	9.61	27.88	21.7	55.47	22.56	21.7	43.93	31.53	21.7	58.94	6.31	21.7	61.80	53.88
22.7	9.79	28.03	22.7	55.59	22.66	22.7	44.50	31.58	22.7	59.18	6.34	22.7	62.13	53.94
23.7	9.98	28.19	23.7	55.71	22.76	23.7	45.05	31.66	23.7	59.39	6.38	23.7	62.50	53.99
24.6	10.17	28.36	24.7	55.84	22.85	24.7	45.57	31.75	24.7	59.59	6.43	24.7	62.87	54.05
25.6	10.37	28.55	25.7	55.96	22.97	25.7	46.06	31.83	25.7	59.78	6.49	25.7	63.27	54.13
26.6	10.57	28.77	26.7	56.10	23.11	26.7	46.53	31.90	26.7	59.97	6.53	26.7	63.68	54.21
27.6	10.77	29.00	27.7	56.23	23.28	27.7	46.99	31.95	27.7	60.14	6.56	27.7	64.11	54.33
28.6	10.97	29.26	28.7	56.37	23.48	28.7	47.44	31.99	28.7	60.32	6.57	28.7	64.53	54.50
29.6	11.15	29.55	29.7	56.50	23.70	29.7	47.92	32.01	29.7	60.51	6.57	29.7	64.92	54.68
30.6	11.31	29.84	30.7	56.62	23.93	30.7	48.43	32.02	30.7	60.70	6.57	30.7	65.30	54.86
31.6	11.46	30.12	31.7	56.73	24.15	31.7	48.96	32.05	31.7	60.91	6.58	31.7	65.65	55.04
11.08	-11.04		6.20	-6.12		20.29	+20.27		7.73	+7.67		18.48	-18.45	
5 ^h 46 ^m 14 ^s .756			6 ^h 46 ^m 58 ^s .546			7 ^h 2 ^m 4 ^s .048			7 ^h 13 ^m 42 ^s .294			7 ^h 16 ^m 20 ^s .292		
-84° 49' 46".89			-80° 43' 38".16			+87° 10' 54".74			+82° 34' 30".13			-86° 54' 6".70		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			♄ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			♄ Chamaeleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "	
	8 16 +88 52			9 8 -85 19			9 25 +81 41			9 36 -80 34			10 21 +82 58	
0.8	28.08 32.77	0.9	38.57 56.89	0.9	25.86 18.14	0.9	14.57 9.04	0.9	5.23 25.86					
1.8	29.09 32.55	1.9	38.81 56.70	1.9	25.97 12.86	1.9	14.68 8.83	1.9	5.31 25.52					
2.8	30.15 32.33	2.8	39.06 56.56	2.9	26.08 12.55	2.9	14.80 8.64	2.9	5.40 25.16					
3.8	31.30 32.10	3.8	39.30 56.43	3.9	26.20 12.22	3.9	14.91 8.49	3.9	5.49 24.80					
4.8	32.52 31.88	4.8	39.53 56.31	4.9	26.34 11.91	4.9	15.02 8.35	4.9	5.62 24.43					
5.8	33.80 31.68	5.8	39.74 56.18	5.9	26.49 11.62	5.9	15.13 8.19	5.9	5.75 24.06					
6.8	35.11 31.50	6.8	39.95 56.05	6.9	26.64 11.33	6.9	15.23 8.02	6.9	5.89 23.72					
7.8	36.44 31.35	7.8	40.16 55.90	7.8	26.81 11.07	7.9	15.33 7.85	7.9	6.03 23.38					
8.8	37.75 31.21	8.8	40.36 55.72	8.8	26.96 10.83	8.9	15.43 7.67	8.9	6.18 23.07					
9.8	39.02 31.09	9.8	40.58 55.55	9.8	27.12 10.59	9.9	15.53 7.48	9.9	6.32 22.77					
10.8	40.24 30.99	10.8	40.80 55.39	10.8	27.26 10.37	10.8	15.64 7.29	10.9	6.46 22.48					
11.8	41.42 30.88	11.8	41.04 55.23	11.8	27.41 10.17	11.8	15.74 7.09	11.9	6.60 22.20					
12.8	42.55 30.76	12.8	41.29 55.07	12.8	27.54 9.97	12.8	15.87 6.89	12.9	6.73 21.93					
13.8	43.67 30.63	13.8	41.56 54.92	13.8	27.67 9.75	13.8	15.99 6.71	13.9	6.85 21.67					
14.8	44.76 30.51	14.8	41.83 54.80	14.8	27.80 9.53	14.8	16.12 6.57	14.9	6.96 21.40					
15.8	45.87 30.39	15.8	42.11 54.69	15.8	27.93 9.30	15.8	16.25 6.43	15.9	7.08 21.12					
16.8	47.00 30.25	16.8	42.38 54.59	16.8	28.06 9.06	16.8	16.39 6.32	16.9	7.20 20.81					
17.8	48.18 30.10	17.8	42.67 54.53	17.8	28.19 8.82	17.8	16.53 6.22	17.9	7.32 20.49					
18.8	49.42 29.94	18.8	42.94 54.48	18.8	28.34 8.57	18.8	16.66 6.13	18.9	7.46 20.17					
19.8	50.74 29.79	19.8	43.20 54.43	19.8	28.52 8.32	19.8	16.79 6.06	19.9	7.60 19.85					
20.8	52.12 29.67	20.8	43.44 54.38	20.8	28.68 8.08	20.8	16.92 5.99	20.8	7.78 19.53					
21.8	53.53 29.57	21.8	43.67 54.33	21.8	28.85 7.85	21.8	17.04 5.91	21.8	7.96 19.23					
22.8	54.95 29.50	22.8	43.90 54.25	22.8	29.04 7.64	22.8	17.16 5.82	22.8	8.14 18.94					
23.8	56.33 29.44	23.8	44.14 54.17	23.8	29.22 7.46	23.8	17.27 5.71	23.8	8.32 18.70					
24.8	57.66 29.40	24.8	44.37 54.08	24.8	29.40 7.31	24.8	17.39 5.61	24.8	8.50 18.45					
25.8	58.90 29.36	25.8	44.64 53.99	25.8	29.55 7.16	25.8	17.51 5.50	25.8	8.66 18.22					
26.7	60.08 29.32	26.8	44.92 53.92	26.8	29.70 7.00	26.8	17.64 5.38	26.8	8.81 18.00					
27.7	61.22 29.27	27.8	45.21 53.87	27.8	29.85 6.82	27.8	17.78 5.30	27.8	8.95 17.78					
28.7	62.34 29.19	28.8	45.51 53.84	28.8	29.98 6.65	28.8	17.94 5.25	28.8	9.09 17.54					
29.7	63.50 29.11	29.8	45.81 53.85	29.8	30.12 6.46	29.8	18.08 5.21	29.8	9.24 17.27					
30.7	64.72 29.02	30.8	46.11 53.89	30.8	30.29 6.25	30.8	18.24 5.21	30.8	9.38 16.99					
31.7	66.01 28.92	31.8	46.39 53.92	31.8	30.46 6.05	31.8	18.39 5.23	31.8	9.55 16.71					
50.94	+50.93	12.29	-12.25	6.91	+6.84	6.10	-6.02	8.17	+8.11					
8 ^h 15 ^m 48 ^s .380		9 ^h 8 ^m 57 ^s .938		9 ^h 25 ^m 21 ^s .719		9 ^h 36 ^m 22 ^s .347		10 ^h 21 ^m 4 ^s .831						
+88° 53' 0'' .29		-85° 19' 57'' .45		+81° 41' 41'' .50		-80° 34' 6'' .83		+82° 58' 54'' .07						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

77 Octantis. Mag. 6.3			Bradley 1673. Mag. 6.3			2 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	10 59	-84 8		12 13	+88 9		12 45	-84 40		12 48	+83 51		13 27	-85 21
	s	"		s	"		s	"		s	"		s	"
0.9	42.60	62.69	0.9	53.44	13.06	1.0	58.94	43.99	1.0	20.19	31.02	1.0	8.12	66.47
1.9	42.74	62.41	1.9	53.39	12.70	2.0	58.97	43.65	2.0	20.14	30.66	2.0	8.11	66.12
2.9	42.87	62.16	2.9	53.32	12.32	2.9	59.01	43.33	3.0	20.09	30.29	3.0	8.10	65.81
3.9	42.99	61.92	3.9	53.27	11.91	3.9	59.07	43.04	3.9	20.05	29.89	4.0	8.11	65.53
4.9	43.12	61.70	4.9	53.28	11.49	4.9	59.12	42.76	4.9	20.01	29.47	5.0	8.12	65.26
5.9	43.23	61.47	5.9	53.33	11.07	5.9	59.15	42.50	5.9	20.00	29.04	6.0	8.13	64.98
6.9	43.33	61.23	6.9	53.43	10.64	6.9	59.17	42.23	6.9	20.00	28.62	7.0	8.12	64.71
7.9	43.44	60.98	7.9	53.58	10.22	7.9	59.19	41.95	7.9	20.01	28.20	8.0	8.09	64.43
8.9	43.54	60.73	8.9	53.76	9.84	8.9	59.20	41.66	8.9	20.02	27.79	9.0	8.05	64.15
9.9	43.63	60.46	9.9	53.94	9.46	9.9	59.21	41.34	9.9	20.06	27.40	10.0	8.02	63.84
10.9	43.74	60.19	10.9	54.13	9.10	10.9	59.23	41.01	10.9	20.09	27.02	11.0	7.99	63.52
11.9	43.86	59.91	11.9	54.31	8.76	11.9	59.26	40.68	11.9	20.10	26.66	12.0	7.97	63.18
12.9	44.00	59.62	12.9	54.46	8.41	12.9	59.29	40.36	12.9	20.11	26.30	13.0	7.96	62.83
13.9	44.14	59.34	13.9	54.61	8.07	13.9	59.34	40.01	13.9	20.12	25.95	13.9	7.97	62.49
14.9	44.29	59.09	14.9	54.72	7.72	14.9	59.41	39.67	14.9	20.13	25.61	14.9	7.99	62.15
15.9	44.46	58.85	15.9	54.82	7.38	15.9	59.50	39.32	15.9	20.13	25.26	15.9	8.03	61.81
16.9	44.63	58.61	16.9	54.92	7.01	16.9	59.59	38.99	16.9	20.13	24.89	16.9	8.09	61.48
17.9	44.80	58.40	17.9	55.03	6.63	17.9	59.69	38.71	17.9	20.14	24.51	17.9	8.17	61.15
18.9	44.98	58.20	18.9	55.16	6.23	18.9	59.80	38.41	18.9	20.15	24.12	18.9	8.25	60.84
19.9	45.16	58.02	19.9	55.34	5.82	19.9	59.91	38.15	19.9	20.17	23.71	19.9	8.33	60.56
20.9	45.31	57.85	20.9	55.56	5.43	20.9	60.01	37.92	20.9	20.21	23.28	20.9	8.40	60.29
21.9	45.46	57.68	21.9	55.84	5.04	21.9	60.10	37.68	21.9	20.27	22.86	21.9	8.46	60.03
22.9	45.60	57.50	22.9	56.17	4.64	22.9	60.18	37.42	22.9	20.33	22.45	22.9	8.51	59.77
23.9	45.74	57.30	23.9	56.50	4.26	23.9	60.25	37.16	23.9	20.41	22.05	23.9	8.54	59.49
24.9	45.89	57.08	24.9	56.86	3.90	24.9	60.33	36.88	24.9	20.49	21.66	24.9	8.58	59.18
25.9	46.04	56.86	25.9	57.19	3.57	25.9	60.41	36.58	25.9	20.55	21.29	25.9	8.63	58.85
26.9	46.22	56.66	26.9	57.48	3.24	26.9	60.50	36.26	26.9	20.60	20.96	26.9	8.70	58.52
27.9	46.41	56.46	27.9	57.72	2.92	27.9	60.63	35.95	27.9	20.65	20.62	27.9	8.79	58.18
28.9	46.62	56.27	28.9	57.95	2.61	28.9	60.76	35.65	28.9	20.69	20.28	28.9	8.91	57.85
29.9	46.82	56.12	29.9	58.15	2.26	29.9	60.93	35.36	29.9	20.73	19.93	29.9	9.04	57.54
30.9	47.05	55.98	30.9	58.38	1.90	30.9	61.10	35.12	30.9	20.77	19.56	30.9	9.18	57.24
31.8	47.26	55.87	31.9	58.63	1.53	31.9	61.27	34.88	31.9	20.82	19.17	31.9	9.34	56.97
9.81	-9.76		31.01	+30.99		10.78	-10.73		9.35	+9.29		12.38	-12.34	
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".84			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2333. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.	Wash. Mean Time.	Right Ascension.	Declination.
Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "		Oct.	h m ° ' "	
	14 13 -83 17			15 2 +87 32			15 23 -84 11			16 54 +82 10			17 16 -80 47	
	s " "			s " "			s " "			s " "			s " "	
1.1	27.27 46.80	1.1	58.66 66.01	1.1	61.12 56.95	1.2	15.05 43.06	1.2	4.14 28.48					
2.1	27.22 46.47	2.1	58.24 65.76	2.1	61.01 56.67	2.2	14.88 42.96	2.2	4.02 28.31					
3.1	27.19 46.15	3.1	57.79 65.50	3.1	60.91 56.38	3.2	14.70 42.86	3.2	3.92 28.14					
4.1	27.16 45.87	4.1	57.34 65.21	4.1	60.82 56.12	4.2	14.51 42.74	4.2	3.82 28.00					
5.1	27.14 45.61	5.1	56.92 64.91	5.1	60.73 55.88	5.2	14.33 42.59	5.2	3.73 27.85					
6.1	27.11 45.33	6.1	56.50 64.58	6.1	60.65 55.66	6.2	14.16 42.42	6.2	3.65 27.72					
7.0	27.07 45.05	7.1	56.13 64.21	7.1	60.56 55.43	7.2	13.98 42.23	7.2	3.56 27.60					
8.0	27.03 44.80	8.1	55.80 63.85	8.1	60.44 55.21	8.2	13.81 42.01	8.2	3.46 27.50					
9.0	26.98 44.53	9.1	55.48 63.51	9.1	60.32 54.98	9.2	13.65 41.79	9.2	3.34 27.39					
10.0	26.92 44.23	10.1	55.20 63.19	10.1	60.20 54.74	10.2	13.50 41.58	10.2	3.22 27.26					
11.0	26.86 43.91	11.1	54.92 62.87	11.1	60.08 54.47	11.1	13.35 41.38	11.2	3.10 27.13					
12.0	26.81 43.61	12.1	54.66 62.53	12.1	59.96 54.20	12.1	13.21 41.18	12.2	2.98 26.98					
13.0	26.76 43.28	13.1	54.39 62.21	13.1	59.84 53.92	13.1	13.06 40.98	13.2	2.86 26.80					
14.0	26.73 42.95	14.1	54.11 61.94	14.1	59.74 53.60	14.1	12.92 40.80	14.2	2.73 26.60					
15.0	26.70 42.61	15.1	53.80 61.65	15.1	59.64 53.28	15.1	12.77 40.63	15.2	2.62 26.39					
16.0	26.69 42.26	16.1	53.50 61.37	16.1	59.56 52.94	16.1	12.62 40.47	16.2	2.52 26.17					
17.0	26.69 41.92	17.1	53.18 61.05	17.1	59.50 52.62	17.1	12.47 40.30	17.1	2.41 25.94					
18.0	26.71 41.60	18.1	52.85 60.73	18.1	59.44 52.31	18.1	12.31 40.12	18.1	2.32 25.71					
19.0	26.74 41.27	19.1	52.52 60.39	19.1	59.40 52.01	19.1	12.15 39.91	19.1	2.24 25.49					
20.0	26.76 41.00	20.0	52.20 60.05	20.1	59.37 51.72	20.1	11.99 39.68	20.1	2.18 25.30					
21.0	26.78 40.71	21.0	51.91 59.68	21.1	59.34 51.46	21.1	11.84 39.45	21.1	2.12 25.10					
22.0	26.79 40.44	22.0	51.66 59.29	22.1	59.29 51.20	22.1	11.68 39.18	22.1	2.04 24.92					
23.0	26.79 40.19	23.0	51.43 58.90	23.1	59.24 50.94	23.1	11.54 38.89	23.1	1.96 24.74					
24.0	26.80 39.91	24.0	51.24 58.51	24.1	59.18 50.68	24.1	11.40 38.59	24.1	1.88 24.58					
24.9	26.79 39.60	25.0	51.07 58.15	25.0	59.10 50.41	25.1	11.27 38.32	25.1	1.79 24.40					
25.9	26.78 39.28	26.0	50.91 57.79	26.0	59.04 50.10	26.1	11.15 38.06	26.1	1.69 24.18					
26.9	26.79 38.96	27.0	50.75 57.46	27.0	58.98 49.78	27.1	11.03 37.81	27.1	1.59 23.93					
27.9	26.82 38.61	28.0	50.56 57.14	28.0	58.93 49.43	28.1	10.90 37.57	28.1	1.49 23.66					
28.9	26.85 38.26	29.0	50.34 56.83	29.0	58.91 49.07	29.1	10.78 37.35	29.1	1.41 23.39					
29.9	26.90 37.92	30.0	50.09 56.51	30.0	58.90 48.71	30.1	10.65 37.15	30.1	1.33 23.10					
30.9	26.98 37.60	31.0	49.85 56.17	31.0	58.91 48.38	31.1	10.51 36.92	31.1	1.28 22.80					
31.9	27.06 37.31	32.0	49.61 55.81	32.0	58.95 48.07	32.1	10.38 36.67	32.1	1.24 22.51					
8.57	-8.51	23.40	+23.37	9.89	-9.84	7.35	+7.28	6.25	-6.17					
14 ^h 13 ^m 27 ^s .793		15 ^h 3 ^m 41 ^s .175		15 ^h 23 ^m 56 ^s .594		16 ^h 54 ^m 25 ^s .488		17 ^h 15 ^m 54 ^s .896						
-83° 17' 21".03		+87° 33' 10".52		-84° 11' 30".39		+82° 10' 32".75		-80° 47' 6".56						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Urse Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Urse Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m 17 58	° ' " +86 37	Oct.	h m 18 6	° ' " -87 40	Oct.	h m 19 0	° ' " +89 1	Oct.	h m 19 29	° ' " -89 13	Oct.	h m 20 48	° ' " +82 13
	s "	"		s "	"		s "	"		s "	"		s "	"
1.2	36.90	8.51	1.2	46.63	11.22	1.3	88.46	25.23	1.3	48.60	40.11	1.3	40.54	59.88
2.2	36.49	8.52	2.2	46.11	11.13	2.3	87.06	25.34	2.3	46.95	40.13	2.3	40.42	60.14
3.2	36.04	8.52	3.2	45.64	11.03	3.3	85.59	25.45	3.3	45.38	40.14	3.3	40.28	60.41
4.2	35.58	8.50	4.2	45.20	10.94	4.3	84.04	25.56	4.3	43.91	40.14	4.3	40.14	60.67
5.2	35.12	8.47	5.2	44.75	10.84	5.3	82.43	25.63	5.3	42.50	40.14	5.3	39.99	60.93
6.2	34.67	8.42	6.2	44.31	10.76	6.3	80.80	25.69	6.3	41.15	40.18	6.3	39.83	61.16
7.2	34.20	8.32	7.2	43.88	10.69	7.2	79.17	25.73	7.3	39.79	40.23	7.3	39.66	61.36
8.2	33.77	8.22	8.2	43.42	10.63	8.2	77.57	25.73	8.3	38.38	40.27	8.3	39.49	61.55
9.2	33.33	8.11	9.2	42.95	10.58	9.2	76.01	25.72	9.3	36.91	40.32	9.3	39.32	61.74
10.2	32.92	8.01	10.2	42.44	10.50	10.2	74.51	25.72	10.3	35.36	40.36	10.3	39.15	61.90
11.2	32.53	7.90	11.2	41.92	10.42	11.2	73.07	25.70	11.3	33.75	40.41	11.3	39.00	62.05
12.2	32.15	7.79	12.2	41.38	10.34	12.2	71.68	25.69	12.3	32.06	40.42	12.3	38.84	62.20
13.2	31.76	7.69	13.2	40.83	10.24	13.2	70.31	25.70	13.3	30.33	40.43	13.3	38.68	62.34
14.2	31.39	7.60	14.2	40.30	10.10	14.2	68.95	25.71	14.2	28.56	40.41	14.3	38.53	62.49
15.2	31.01	7.53	15.2	39.77	9.95	15.2	67.59	25.71	15.2	26.81	40.38	15.3	38.39	62.67
16.2	30.62	7.45	16.2	39.26	9.78	16.2	66.20	25.74	16.2	25.08	40.35	16.3	38.24	62.85
17.2	30.21	7.38	17.2	38.79	9.60	17.2	64.78	25.77	17.2	23.41	40.27	17.3	38.10	63.02
18.2	29.80	7.30	18.2	38.35	9.41	18.2	63.29	25.80	18.2	21.83	40.19	18.3	37.94	63.20
19.2	29.37	7.20	19.2	37.94	9.23	19.2	61.73	25.81	19.2	20.35	40.09	19.3	37.77	63.38
20.2	28.94	7.07	20.2	37.56	9.08	20.2	60.13	25.81	20.2	18.94	40.03	20.3	37.60	63.57
21.2	28.50	6.94	21.2	37.18	8.93	21.2	58.50	25.77	21.2	17.60	39.96	21.3	37.42	63.72
22.2	28.06	6.77	22.2	36.81	8.79	22.2	56.84	25.73	22.2	16.28	39.91	22.3	37.24	63.86
23.2	27.65	6.59	23.2	36.42	8.66	23.2	55.24	25.67	23.2	14.91	39.87	23.3	37.05	63.97
24.2	27.26	6.39	24.2	36.00	8.53	24.2	53.73	25.58	24.2	13.46	39.84	24.3	36.87	64.06
25.2	26.88	6.20	25.2	35.54	8.38	25.2	52.29	25.47	25.2	11.92	39.81	25.3	36.69	64.12
26.2	26.53	6.02	26.2	35.07	8.21	26.2	50.92	25.38	26.2	10.28	39.77	26.3	36.52	64.18
27.1	26.19	5.87	27.2	34.59	8.01	27.2	49.61	25.32	27.2	8.58	39.69	27.3	36.37	64.27
28.1	25.85	5.73	28.2	34.13	7.78	28.2	48.31	25.28	28.2	6.87	39.57	28.3	36.22	64.38
29.1	25.48	5.60	29.1	33.70	7.54	29.2	46.97	25.24	29.2	5.22	39.43	29.3	36.06	64.50
30.1	25.11	5.47	30.1	33.31	7.28	30.2	45.58	25.21	30.2	3.66	39.28	30.3	35.91	64.63
31.1	24.73	5.33	31.1	32.96	7.03	31.2	44.11	25.18	31.2	2.19	39.10	31.3	35.73	64.77
32.1	24.34	5.20	32.1	32.63	6.78	32.2	42.60	25.14	32.2	0.85	38.92	32.3	35.56	64.87
16.95	+16.93		24.59	-24.57		58.70	+58.69		74.21	-74.20		7.40	+7.33	
17 ^h 59 ^m	1° 30'		18 ^h 6 ^m	11° 89'		19 ^h 2 ^m	39° 62'		19 ^h 27 ^m	42° 218'		20 ^h 48 ^m	40° 494'	
+86° 36'	51' 17"		-87° 39'	51' 82"		+89° 1'	2' 17"		-89° 13'	28' 57"		+82° 13'	29' 86"	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "	Oct.	h m	° ' "
	21 38	-83 6		22 16	-86 23		22 37	-81 48		23 27	+86 51		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.4	37.96	2.42	1.4	39.75	18.60	1.4	54.18	50.72	1.4	63.74	26.06	1.5	30.49	29.87
2.4	37.82	2.62	2.4	39.51	18.83	2.4	54.09	50.97	2.4	63.69	26.44	2.5	30.43	30.19
3.4	37.67	2.81	3.4	39.27	19.05	3.4	54.00	51.20	3.4	63.64	26.83	3.5	30.37	30.47
4.4	37.54	2.97	4.4	39.04	19.27	4.4	53.91	51.43	4.4	63.57	27.25	4.5	30.32	30.74
5.4	37.42	3.13	5.4	38.84	19.46	5.4	53.83	51.65	5.4	63.47	27.65	5.5	30.26	31.01
6.4	37.32	3.30	6.4	38.65	19.66	6.4	53.76	51.87	6.4	63.34	28.06	6.4	30.23	31.27
7.4	37.21	3.48	7.4	38.46	19.88	7.4	53.70	52.10	7.4	63.18	28.47	7.4	30.20	31.53
8.4	37.08	3.67	8.4	38.28	20.10	8.4	53.64	52.33	8.4	63.01	28.84	8.4	30.17	31.81
9.4	36.96	3.88	9.4	38.08	20.34	9.4	53.56	52.59	9.4	62.83	29.19	9.4	30.13	32.09
10.3	36.83	4.09	10.4	37.87	20.59	10.4	53.48	52.86	10.4	62.63	29.53	10.4	30.08	32.40
11.3	36.70	4.31	11.4	37.65	20.84	11.4	53.39	53.13	11.4	62.45	29.85	11.4	30.03	32.72
12.3	36.55	4.51	12.4	37.40	21.09	12.4	53.30	53.41	12.4	62.26	30.18	12.4	29.98	33.05
13.3	36.40	4.71	13.4	37.12	21.33	13.4	53.18	53.68	13.4	62.10	30.49	13.4	29.89	33.38
14.3	36.22	4.89	14.4	36.84	21.56	14.4	53.06	53.94	14.4	61.95	30.81	14.4	29.81	33.69
15.3	36.04	5.06	15.4	36.53	21.78	15.4	52.94	54.18	15.4	61.80	31.13	15.4	29.72	34.00
16.3	35.87	5.20	16.4	36.21	21.97	16.4	52.82	54.41	16.4	61.66	31.47	16.4	29.62	34.29
17.3	35.70	5.34	17.4	35.90	22.14	17.4	52.69	54.59	17.4	61.52	31.82	17.4	29.52	34.58
18.3	35.52	5.44	18.4	35.61	22.29	18.4	52.57	54.77	18.4	61.37	32.19	18.4	29.43	34.85
19.3	35.38	5.54	19.4	35.33	22.44	19.4	52.46	54.95	19.4	61.21	32.56	19.4	29.34	35.08
20.3	35.23	5.63	20.3	35.06	22.57	20.4	52.36	55.12	20.4	61.02	32.94	20.4	29.26	35.31
21.3	35.10	5.72	21.3	34.83	22.70	21.4	52.27	55.29	21.4	60.79	33.31	21.4	29.18	35.53
22.3	34.96	5.84	22.3	34.58	22.86	22.4	52.18	55.47	22.4	60.55	33.68	22.4	29.10	35.75
23.3	34.83	5.97	23.3	34.35	23.03	23.4	52.09	55.68	23.4	60.28	34.01	23.4	29.04	35.99
24.3	34.70	6.09	24.3	34.09	23.21	24.4	51.99	55.87	24.4	60.00	34.34	24.4	28.96	36.26
25.3	34.54	6.24	25.3	33.82	23.38	25.3	51.87	56.09	25.4	59.72	34.62	25.4	28.88	36.53
26.3	34.37	6.38	26.3	33.51	23.56	26.3	51.74	56.29	26.4	59.48	34.90	26.4	28.78	36.82
27.3	34.19	6.49	27.3	33.19	23.74	27.3	51.61	56.49	27.4	59.24	35.18	27.4	28.66	37.10
28.3	33.99	6.60	28.3	32.83	23.88	28.3	51.46	56.68	28.4	59.03	35.46	28.4	28.55	37.37
29.3	33.80	6.67	29.3	32.47	23.99	29.3	51.31	56.85	29.4	58.84	35.77	29.4	28.40	37.61
30.3	33.61	6.73	30.3	32.12	24.09	30.3	51.16	56.98	30.4	58.65	36.08	30.4	28.27	37.85
31.3	33.43	6.75	31.3	31.79	24.18	31.3	51.02	57.09	31.4	58.43	36.42	31.4	28.14	38.04
32.3	33.26	6.76	32.3	31.46	24.24	32.3	50.89	57.19	32.4	58.20	36.75	32.4	28.01	38.23
8.33	-8.27		15.88	-15.85		7.02	-6.95		18.25	+18.22		7.64	-7.57	
21 ^h 38 ^m 19 ^s .542			22 ^h 16 ^m 8 ^s .656			22 ^h 37 ^m 39 ^s .016			23 ^h 27 ^m 44 ^s .125			23 ^h 47 ^m 16 ^s .424		
-83° 6' 6''.99			-86° 23' 27''.13			-81° 49' 2''.34			+86° 50' 58''.89			-82° 28' 48''.42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "
	0 57	+85 49		1 31	+88 52		1 42	-85 11		4 10	+85 20		5 35	+85 9
	s	"		s	"		s	"		s	"		s	"
0.4	33.26	16.78	0.5	46.43	11.13	0.5	13.56	4.88	0.6	37.24	14.98	0.6	45.42	20.82
1.4	33.22	17.16	1.4	46.45	11.53	1.5	13.45	5.16	1.6	37.46	15.27	1.6	45.70	20.99
2.4	33.16	17.54	2.4	46.39	11.94	2.5	13.35	5.43	2.6	37.66	15.59	2.6	45.99	21.19
3.4	33.08	17.93	3.4	46.24	12.35	3.5	13.26	5.70	3.6	37.86	15.92	3.6	46.27	21.43
4.4	32.97	18.32	4.4	46.02	12.75	4.4	13.18	5.97	4.6	38.04	16.26	4.6	46.52	21.68
5.4	32.84	18.68	5.4	45.74	13.13	5.4	13.12	6.25	5.6	38.19	16.61	5.6	46.76	21.94
6.4	32.72	19.02	6.4	45.41	13.50	6.4	13.04	6.54	6.5	38.33	16.95	6.6	46.99	22.21
7.4	32.58	19.35	7.4	45.07	13.84	7.4	12.95	6.86	7.5	38.46	17.28	7.6	47.20	22.47
8.4	32.45	19.67	8.4	44.73	14.19	8.4	12.86	7.16	8.5	38.56	17.60	8.6	47.40	22.72
9.4	32.32	19.96	9.4	44.39	14.51	9.4	12.76	7.48	9.5	38.69	17.91	9.6	47.59	22.96
10.4	32.19	20.25	10.4	44.10	14.84	10.4	12.63	7.81	10.5	38.81	18.20	10.6	47.78	23.19
11.4	32.09	20.55	11.4	43.84	15.15	11.4	12.51	8.13	11.5	38.93	18.48	11.6	47.97	23.39
12.4	31.99	20.86	12.4	43.60	15.46	12.4	12.36	8.46	12.5	39.05	18.76	12.6	48.17	23.60
13.4	31.89	21.17	13.4	43.39	15.79	13.4	12.18	8.76	13.5	39.20	19.04	13.6	48.40	23.81
14.4	31.79	21.49	14.4	43.19	16.13	14.4	12.02	9.05	14.5	39.35	19.35	14.6	48.62	24.02
15.4	31.70	21.82	15.4	42.96	16.49	15.4	11.85	9.32	15.5	39.50	19.66	15.6	48.85	24.24
16.4	31.58	22.17	16.4	42.67	16.86	16.4	11.69	9.56	16.5	39.66	20.01	16.6	49.09	24.47
17.4	31.44	22.52	17.4	42.32	17.24	17.4	11.54	9.79	17.5	39.81	20.36	17.6	49.33	24.74
18.4	31.27	22.87	18.4	41.89	17.62	18.4	11.39	10.02	18.5	39.94	20.73	18.6	49.56	25.05
19.4	31.10	23.22	19.4	41.36	18.00	19.4	11.25	10.24	19.5	40.04	21.11	19.6	49.76	25.37
20.4	30.91	23.54	20.4	40.78	18.34	20.4	11.12	10.46	20.5	40.13	21.47	20.6	49.95	25.68
21.4	30.71	23.83	21.4	40.17	18.68	21.4	10.98	10.71	21.5	40.19	21.82	21.6	50.11	25.98
22.4	30.50	24.10	22.4	39.57	18.99	22.4	10.84	10.98	22.5	40.24	22.16	22.6	50.26	26.27
23.4	30.32	24.34	23.4	39.02	19.27	23.4	10.66	11.27	23.5	40.30	22.49	23.6	50.40	26.56
24.4	30.15	24.59	24.4	38.53	19.54	24.4	10.48	11.55	24.5	40.35	22.80	24.6	50.54	26.80
25.4	30.00	24.83	25.4	38.09	19.82	25.4	10.26	11.81	25.5	40.43	23.09	25.6	50.69	27.03
26.4	29.86	25.11	26.4	37.68	20.11	26.4	10.04	12.06	26.5	40.52	23.39	26.6	50.87	27.26
27.4	29.73	25.36	27.4	37.28	20.42	27.4	9.82	12.29	27.5	40.62	23.69	27.5	51.05	27.50
28.4	29.58	25.66	28.4	36.85	20.74	28.4	9.60	12.49	28.5	40.72	24.01	28.5	51.23	27.78
29.3	29.41	25.97	29.4	36.35	21.07	29.4	9.39	12.68	29.5	40.82	24.35	29.5	51.42	28.06
30.3	29.23	26.27	30.4	35.78	21.42	30.4	9.19	12.85	30.5	40.89	24.68	30.5	51.61	28.38
31.3	29.01	26.56	31.4	35.11	21.75	31.4	8.99	13.03	31.5	40.95	25.06	31.5	51.77	28.70
13.73 +13.69			50.76 +50.75			11.92 -11.87			12.31 +12.26			11.84 +11.80		
0 ^h 57 ^m 9 ^s .300			1 ^h 30 ^m 13 ^s .156			1 ^h 42 ^m 2 ^s .339			4 ^h 10 ^m 2 ^s .561			5 ^h 35 ^m 12 ^s .782		
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensae. Mag. 6.2			C Mensae. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "
Nov.	5 46	-84 49	Nov.	6 46	-80 43	Nov.	7 2	+87 10	Nov.	7 14	+82 34	Nov.	7 16	-86 58
0.6	11.46	30.12	0.7	56.73	24.15	0.7	48.96	32.05	0.7	0.91	6.58	0.7	5.65	55.04
1.6	11.60	30.40	1.7	56.84	24.37	1.7	49.51	32.10	1.7	1.13	6.61	1.7	5.98	55.22
2.6	11.74	30.66	2.7	56.95	24.58	2.7	50.07	32.18	2.7	1.36	6.65	2.7	6.30	55.40
3.6	11.88	30.90	3.7	57.06	24.76	3.7	50.62	32.29	3.7	1.58	6.72	3.7	6.62	55.55
4.6	12.03	31.13	4.7	57.16	24.95	4.7	51.16	32.41	4.7	1.79	6.82	4.7	6.94	55.69
5.6	12.17	31.37	5.7	57.27	25.12	5.7	51.67	32.54	5.7	1.99	6.93	5.7	7.27	55.83
6.6	12.33	31.61	6.7	57.38	25.30	6.7	52.15	32.68	6.7	2.18	7.04	6.7	7.62	55.99
7.6	12.48	31.86	7.7	57.49	25.50	7.7	52.61	32.81	7.7	2.36	7.14	7.7	7.98	56.15
8.6	12.64	32.12	8.7	57.61	25.71	8.7	53.05	32.94	8.7	2.54	7.24	8.7	8.34	56.32
9.6	12.80	32.40	9.6	57.73	25.93	9.7	53.48	33.07	9.7	2.71	7.35	9.7	8.71	56.49
10.6	12.95	32.71	10.6	57.85	26.19	10.7	53.89	33.20	10.7	2.88	7.46	10.7	9.08	56.69
11.6	13.09	33.03	11.6	57.96	26.46	11.7	54.31	33.31	11.7	3.05	7.55	11.7	9.45	56.90
12.6	13.23	33.37	12.6	58.07	26.73	12.6	54.74	33.41	12.7	3.21	7.63	12.7	9.80	57.14
13.6	13.36	33.71	13.6	58.18	27.03	13.6	55.19	33.51	13.7	3.39	7.70	13.7	10.14	57.39
14.6	13.46	34.04	14.6	58.28	27.33	14.6	55.65	33.62	14.7	3.57	7.77	14.7	10.46	57.65
15.6	13.56	34.38	15.6	58.37	27.63	15.6	56.14	33.74	15.6	3.76	7.86	15.7	10.75	57.91
16.6	13.64	34.71	16.6	58.46	27.93	16.6	56.65	33.86	16.6	3.97	7.96	16.6	11.01	58.16
17.6	13.73	35.01	17.6	58.54	28.22	17.6	57.16	34.02	17.6	4.17	8.09	17.6	11.26	58.41
18.6	13.81	35.30	18.6	58.62	28.47	18.6	57.66	34.19	18.6	4.38	8.25	18.6	11.51	58.64
19.6	13.89	35.57	19.6	58.70	28.72	19.6	58.14	34.38	19.6	4.58	8.43	19.6	11.76	58.86
20.6	13.98	35.85	20.6	58.79	28.97	20.6	58.59	34.58	20.6	4.76	8.61	20.6	12.03	59.06
21.6	14.08	36.13	21.6	58.87	29.23	21.6	59.01	34.80	21.6	4.93	8.80	21.6	12.31	59.27
22.6	14.18	36.44	22.6	58.97	29.49	22.6	59.38	35.01	22.6	5.08	8.98	22.6	12.61	59.50
23.6	14.28	36.76	23.6	59.06	29.78	23.6	59.74	35.21	23.6	5.23	9.14	23.6	12.91	59.77
24.6	14.37	37.12	24.6	59.14	30.10	24.6	60.11	35.40	24.6	5.37	9.29	24.6	13.21	60.05
25.6	14.45	37.49	25.6	59.22	30.46	25.6	60.47	35.55	25.6	5.52	9.42	25.6	13.50	60.36
26.6	14.51	37.88	26.6	59.30	30.82	26.6	60.86	35.70	26.6	5.68	9.54	26.6	13.76	60.69
27.6	14.56	38.26	27.6	59.37	31.17	27.6	61.27	35.86	27.6	5.85	9.66	27.6	14.00	61.03
28.6	14.59	38.64	28.6	59.43	31.52	28.6	61.70	36.02	28.6	6.03	9.81	28.6	14.20	61.35
29.6	14.62	38.99	29.6	59.49	31.86	29.6	62.14	36.20	29.6	6.21	9.98	29.6	14.39	61.67
30.6	14.65	39.32	30.6	59.55	32.19	30.6	62.58	36.42	30.6	6.39	10.16	30.6	14.57	61.97
31.6	14.67	39.63	31.6	59.60	32.49	31.6	63.01	36.64	31.6	6.57	10.37	31.6	14.75	62.26
11.09	-11.04		6.20	-6.12		20.30	+20.27		7.73	+7.67		18.49	-18.46	
5 ^h 46 ^m 14 ^s .756			6 ^h 46 ^m 58 ^s .546			7 ^h 2 ^m 4 ^s .048			7 ^h 13 ^m 42 ^s .294			7 ^h 16 ^m 20 ^s .292		
-84° 49' 46".89			-80° 43' 38".16			+87° 10' 54".74			+82° 34' 30".13			-86° 54' 6".70		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamaeleontis. Mag. 5.2			30 H. Camelopardalis. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "		h m s	° ' "	
Nov. 8 17	+88 52		Nov. 9 8	-85 19		Nov. 9 25	+81 41		Nov. 9 36	-80 34		Nov. 10 21	+82 58	
0.7	6.01	28.92	0.8	46.39	53.92	0.8	30.46	6.05	0.8	18.39	5.23	0.8	9.55	16.71
1.7	7.37	28.86	1.8	46.67	53.97	1.8	30.63	5.85	1.8	18.52	5.25	1.8	9.72	16.44
2.7	8.76	28.80	2.8	46.92	54.01	2.8	30.81	5.66	2.8	18.66	5.25	2.8	9.92	16.19
3.7	10.17	28.77	3.8	47.17	54.02	3.8	31.01	5.51	3.8	18.79	5.24	3.8	10.11	15.95
4.7	11.56	28.78	4.8	47.41	54.03	4.8	31.20	5.37	4.8	18.92	5.22	4.8	10.32	15.72
5.7	12.91	28.79	5.8	47.66	54.03	5.8	31.38	5.25	5.8	19.04	5.19	5.8	10.51	15.51
6.7	14.20	28.81	6.8	47.93	54.04	6.8	31.56	5.15	6.8	19.18	5.17	6.8	10.70	15.34
7.7	15.44	28.84	7.8	48.19	54.04	7.8	31.73	5.06	7.8	19.32	5.14	7.8	10.89	15.16
8.7	16.64	28.87	8.7	48.47	54.05	8.8	31.89	4.98	8.8	19.45	5.12	8.8	11.06	14.98
9.7	17.80	28.88	9.7	48.75	54.07	9.8	32.04	4.89	9.8	19.59	5.11	9.8	11.23	14.82
10.7	18.92	28.89	10.7	49.05	54.12	10.8	32.19	4.81	10.8	19.74	5.13	10.8	11.40	14.66
11.7	20.04	28.91	11.7	49.35	54.17	11.8	32.34	4.71	11.8	19.90	5.16	11.8	11.56	14.49
12.7	21.17	28.91	12.7	49.64	54.25	12.8	32.50	4.60	12.8	20.05	5.20	12.8	11.72	14.30
13.7	22.32	28.90	13.7	49.94	54.36	13.7	32.66	4.48	13.8	20.20	5.26	13.8	11.88	14.11
14.7	23.55	28.90	14.7	50.23	54.48	14.7	32.83	4.35	14.8	20.35	5.35	14.8	12.06	13.91
15.7	24.83	28.91	15.7	50.50	54.61	15.7	33.00	4.22	15.7	20.51	5.45	15.8	12.24	13.72
16.7	26.16	28.93	16.7	50.76	54.75	16.7	33.19	4.12	16.7	20.65	5.56	16.8	12.44	13.51
17.7	27.52	28.97	17.7	51.00	54.87	17.7	33.39	4.02	17.7	20.79	5.64	17.8	12.66	13.32
18.7	28.90	29.02	18.7	51.24	54.97	18.7	33.58	3.95	18.7	20.92	5.75	18.8	12.88	13.18
19.7	30.25	29.10	19.7	51.48	55.08	19.7	33.79	3.90	19.7	21.04	5.84	19.8	13.10	13.03
20.7	31.54	29.19	20.7	51.71	55.16	20.7	33.97	3.86	20.7	21.16	5.90	20.8	13.33	12.92
21.7	32.75	29.30	21.7	51.96	55.25	21.7	34.16	3.86	21.7	21.29	5.96	21.8	13.52	12.82
22.7	33.88	29.42	22.7	52.23	55.37	22.7	34.33	3.85	22.7	21.43	6.03	22.8	13.71	12.73
23.7	34.95	29.52	23.7	52.51	55.50	23.7	34.47	3.83	23.7	21.57	6.11	23.8	13.89	12.64
24.7	35.97	29.62	24.7	52.79	55.64	24.7	34.62	3.80	24.7	21.72	6.22	24.8	14.07	12.53
25.7	37.02	29.68	25.7	53.08	55.80	25.7	34.77	3.76	25.7	21.87	6.35	25.8	14.23	12.43
26.7	38.10	29.73	26.7	53.36	55.99	26.7	34.93	3.70	26.7	22.03	6.54	26.7	14.40	12.30
27.7	39.24	29.77	27.7	53.63	56.22	27.7	35.10	3.63	27.7	22.18	6.72	27.7	14.58	12.16
28.7	40.44	29.84	28.7	53.88	56.45	28.7	35.28	3.56	28.7	22.32	6.92	28.7	14.78	12.04
29.7	41.69	29.93	29.7	54.12	56.64	29.7	35.46	3.52	29.7	22.46	7.11	29.7	15.00	11.90
30.7	42.95	30.02	30.7	54.34	56.84	30.7	35.65	3.50	30.7	22.58	7.29	30.7	15.22	11.80
31.7	44.21	30.16	31.7	54.55	57.04	31.7	35.85	3.49	31.7	22.71	7.48	31.7	15.45	11.71
50.92	+50.91		12.29	-12.25		6.91	+6.84		6.10	-6.02		8.17	+8.11	
8 ^h 15 ^m 48 ^s .380			9 ^h 8 ^m 57 ^s .938			9 ^h 25 ^m 21 ^s .719			9 ^h 36 ^m 22 ^s .347			10 ^h 21 ^m 4 ^s .831		
+88° 53' 0".29			-85° 19' 57".45			+81° 41' 41".50			-80° 34' 6".88			+82° 58' 54".07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			1 Octantis. Mag. 5.4			33 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
Nov. 10 59	-84 8		Nov. 12 13	+88 8		Nov. 12 46	-84 40		Nov. 12 48	+83 51		Nov. 13 27	-85 21	
	s	"		s	"		s	"		s	"		s	"
0.8	47.26	55.87	0.9	58.63	61.53	0.9	1.27	34.88	0.9	20.82	19.17	0.9	9.34	56.97
1.8	47.46	55.76	1.9	58.94	61.15	1.9	1.43	34.65	1.9	20.88	18.76	1.9	9.49	56.72
2.8	47.66	55.66	2.9	59.30	60.76	2.9	1.58	34.44	2.9	20.97	18.35	2.9	9.62	56.47
3.8	47.85	55.56	3.9	59.70	60.39	3.9	1.72	34.23	3.9	21.07	17.96	3.9	9.75	56.22
4.8	48.03	55.43	4.9	60.15	60.04	4.9	1.85	34.02	4.9	21.17	17.58	4.9	9.86	55.98
5.8	48.20	55.30	5.9	60.60	59.71	5.9	1.98	33.79	5.9	21.28	17.21	5.9	9.96	55.71
6.8	48.38	55.17	6.9	61.07	59.41	6.9	2.11	33.54	6.9	21.39	16.86	6.9	10.07	55.44
7.8	48.57	55.04	7.9	61.50	59.11	7.9	2.25	33.28	7.9	21.50	16.52	7.9	10.20	55.15
8.8	48.76	54.89	8.9	61.92	58.82	8.9	2.39	33.01	8.9	21.60	16.20	8.9	10.32	54.86
9.8	48.98	54.75	9.9	62.34	58.54	9.9	2.56	32.75	9.9	21.70	15.90	9.9	10.46	54.56
10.8	49.20	54.64	10.9	62.73	58.26	10.9	2.73	32.50	10.9	21.79	15.60	10.9	10.62	54.27
11.8	49.43	54.54	11.9	63.10	57.98	11.9	2.92	32.25	11.9	21.89	15.29	11.9	10.80	53.98
12.8	49.66	54.43	12.9	63.45	57.68	12.9	3.12	32.01	12.9	21.98	14.97	12.9	10.98	53.70
13.8	49.90	54.37	13.9	63.82	57.39	13.9	3.33	31.79	13.9	22.06	14.64	13.9	11.18	53.43
14.8	50.14	54.32	14.9	64.19	57.08	14.9	3.56	31.59	14.9	22.15	14.30	14.9	11.41	53.19
15.8	50.38	54.28	15.9	64.61	56.76	15.9	3.77	31.40	15.9	22.26	13.94	15.9	11.61	52.96
16.8	50.61	54.27	16.9	65.07	56.43	16.9	3.98	31.25	16.9	22.38	13.56	16.9	11.82	52.77
17.8	50.81	54.27	17.9	65.58	56.10	17.9	4.17	31.10	17.9	22.51	13.19	17.9	12.03	52.58
18.8	51.01	54.25	18.8	66.14	55.78	18.9	4.36	30.96	18.9	22.66	12.84	18.9	12.21	52.39
19.8	51.21	54.21	19.8	66.73	55.49	19.9	4.55	30.80	19.9	22.82	12.51	19.9	12.39	52.19
20.8	51.41	54.16	20.8	67.33	55.21	20.9	4.72	30.62	20.9	22.98	12.20	20.9	12.56	51.97
21.8	51.60	54.12	21.8	67.91	54.97	21.9	4.90	30.43	21.9	23.13	11.91	21.9	12.73	51.74
22.8	51.83	54.07	22.8	68.46	54.74	22.9	5.09	30.25	22.9	23.28	11.63	22.9	12.91	51.51
23.8	52.06	54.02	23.8	68.97	54.52	23.9	5.30	30.06	23.9	23.42	11.37	23.9	13.13	51.27
24.8	52.30	53.98	24.8	69.44	54.31	24.9	5.53	29.88	24.9	23.53	11.11	24.9	13.36	51.03
25.8	52.55	53.98	25.8	69.89	54.07	25.9	5.77	29.70	25.9	23.64	10.84	25.9	13.60	50.79
26.8	52.82	54.02	26.8	70.34	53.83	26.8	6.04	29.56	26.9	23.77	10.55	26.9	13.87	50.59
27.8	53.07	54.06	27.8	70.80	53.56	27.8	6.30	29.43	27.8	23.90	10.25	27.9	14.14	50.41
28.8	53.32	54.12	28.8	71.31	53.30	28.8	6.55	29.33	28.8	24.03	9.94	28.9	14.42	50.26
29.8	53.55	54.20	29.8	71.87	53.04	29.8	6.80	29.25	29.8	24.20	9.62	29.9	14.68	50.12
30.8	53.77	54.27	30.8	72.48	52.77	30.8	7.04	29.18	30.8	24.37	9.31	30.9	14.92	49.99
31.8	53.97	54.33	31.8	73.13	52.53	31.8	7.25	29.10	31.8	24.55	9.02	31.9	15.16	49.86
9.81	-9.76		30.96	+30.94		10.78	-10.73		9.34	+9.29		12.37	-12.33	
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov.	14 13	-83 17	Nov.	15 2	+87 32	Nov.	15 23	-84 11	Nov.	16 54	+82 10	Nov.	17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
0.9	27.06	37.31	1.0	49.61	55.81	1.0	58.95	48.07	1.1	10.38	36.67	1.1	1.24	22.51
1.9	27.14	37.02	2.0	49.40	55.44	2.0	58.96	47.79	2.1	10.24	36.39	2.1	1.20	22.26
2.9	27.20	36.76	3.0	49.21	55.02	3.0	58.97	47.51	3.1	10.11	36.09	3.1	1.16	22.02
3.9	27.25	36.49	4.0	49.07	54.61	4.0	58.98	47.23	4.1	9.98	35.78	4.1	1.11	21.79
4.9	27.30	36.22	5.0	48.96	54.23	5.0	58.98	46.95	5.1	9.89	35.45	5.1	1.06	21.56
5.9	27.35	35.95	6.0	48.87	53.85	6.0	58.97	46.67	6.1	9.77	35.12	6.1	0.99	21.33
6.9	27.39	35.67	6.9	48.81	53.47	7.0	58.96	46.35	7.1	9.67	34.80	7.1	0.92	21.09
7.9	27.43	35.36	7.9	48.76	53.09	8.0	58.95	46.03	8.1	9.58	34.50	8.1	0.84	20.83
8.9	27.49	35.05	8.9	48.70	52.72	9.0	58.94	45.71	9.1	9.49	34.20	9.1	0.78	20.56
9.9	27.55	34.73	9.9	48.64	52.40	10.0	58.93	45.35	10.1	9.40	33.90	10.1	0.72	20.27
10.9	27.63	34.41	10.9	48.57	52.07	11.0	58.96	45.01	11.1	9.31	33.62	11.1	0.65	19.96
11.9	27.71	34.10	11.9	48.49	51.75	11.9	58.98	44.66	12.1	9.21	33.35	12.1	0.60	19.63
12.9	27.81	33.79	12.9	48.40	51.42	12.9	59.02	44.32	13.1	9.11	33.10	13.1	0.55	19.30
13.9	27.91	33.49	13.9	48.30	51.06	13.9	59.07	43.98	14.1	9.02	32.82	14.1	0.53	18.99
14.9	28.04	33.21	14.9	48.20	50.71	14.9	59.16	43.66	15.1	8.92	32.52	15.1	0.51	18.67
15.9	28.16	32.96	15.9	48.10	50.34	15.9	59.24	43.34	16.1	8.81	32.21	16.1	0.50	18.36
16.9	28.30	32.72	16.9	48.02	49.93	16.9	59.32	43.06	17.0	8.72	31.85	17.1	0.49	18.07
17.9	28.40	32.49	17.9	47.98	49.53	17.9	59.40	42.78	18.0	8.63	31.49	18.1	0.49	17.80
18.9	28.51	32.27	18.9	47.97	49.12	18.9	59.48	42.52	19.0	8.54	31.12	19.1	0.49	17.54
19.9	28.61	32.04	19.9	48.01	48.71	19.9	59.53	42.26	20.0	8.47	30.75	20.1	0.47	17.27
20.9	28.70	31.80	20.9	48.07	48.33	20.9	59.58	42.00	21.0	8.41	30.37	21.1	0.44	17.02
21.9	28.79	31.53	21.9	48.15	47.95	21.9	59.62	41.71	22.0	8.36	30.02	22.0	0.40	16.76
22.9	28.89	31.26	22.9	48.22	47.61	22.9	59.67	41.40	23.0	8.30	29.69	23.0	0.37	16.46
23.9	29.00	30.97	23.9	48.28	47.28	23.9	59.74	41.07	24.0	8.24	29.37	24.0	0.34	16.13
24.9	29.13	30.69	24.9	48.32	46.96	24.9	59.82	40.72	25.0	8.19	29.10	25.0	0.32	15.77
25.9	29.27	30.41	25.9	48.33	46.64	25.9	59.92	40.39	26.0	8.13	28.82	26.0	0.31	15.42
26.9	29.44	30.16	26.9	48.33	46.32	26.9	60.05	40.07	27.0	8.07	28.52	27.0	0.32	15.06
27.9	29.62	29.92	27.9	48.33	45.96	27.9	60.19	39.76	28.0	8.00	28.21	28.0	0.35	14.73
28.9	29.79	29.72	28.9	48.36	45.60	28.9	60.33	39.48	29.0	7.93	27.88	29.0	0.37	14.42
29.9	29.95	29.53	29.9	48.40	45.23	29.9	60.47	39.22	30.0	7.87	27.51	30.0	0.40	14.11
30.9	30.10	29.35	30.9	48.48	44.85	30.9	60.60	38.97	31.0	7.82	27.13	31.0	0.43	13.82
31.9	30.25	29.18	31.9	48.61	44.47	31.9	60.72	38.73	32.0	7.77	26.76	32.0	0.45	13.55
8.56 -8.50			23.37 +23.35			9.89 -9.84			7.35 +7.28			6.25 -6.17		
14 ^h 13 ^m 27 ^s .793			15 ^h 3 ^m 41 ^s .175			15 ^h 23 ^m 56 ^s .594			16 ^h 54 ^m 25 ^s .488			17 ^h 15 ^m 54 ^s .896		
-83° 17' 21".03			+87° 33' 10".52			-84° 11' 30".39			+82° 10' 32".75			-80° 47' 6".56		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			γ Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	s		h m	s		h m	s		h m	s		h m	s
Nov.	17 58	+86 36	Nov.	18 6	-87 39	Nov.	19 0	+89 1	Nov.	19 28	-89 13	Nov.	20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
1.1	24.34	65.20	1.1	32.63	66.78	1.2	42.60	25.14	1.2	60.85	38.92	1.3	35.56	4.87
2.1	23.93	65.02	2.1	32.34	66.53	2.2	41.06	25.06	2.2	59.57	38.77	2.3	35.39	4.98
3.1	23.54	64.80	3.1	32.05	66.32	3.2	39.50	24.96	3.2	58.31	38.64	3.2	35.21	5.07
4.1	23.15	64.57	4.1	31.74	66.12	4.2	37.98	24.83	4.2	57.06	38.53	4.2	35.02	5.13
5.1	22.78	64.34	5.1	31.42	65.91	5.2	36.52	24.69	5.2	55.76	38.41	5.2	34.84	5.18
6.1	22.45	64.10	6.1	31.07	65.71	6.2	35.11	24.55	6.2	54.42	38.28	6.2	34.65	5.19
7.1	22.13	63.86	7.1	30.71	65.48	7.2	33.77	24.40	7.2	52.98	38.15	7.2	34.47	5.20
8.1	21.82	63.62	8.1	30.33	65.26	8.2	32.49	24.25	8.2	51.51	38.02	8.2	34.30	5.18
9.1	21.52	63.38	9.1	29.95	65.02	9.2	31.25	24.11	9.2	50.00	37.85	9.2	34.13	5.18
10.1	21.23	63.17	10.1	29.57	64.75	10.2	30.05	23.96	10.2	48.47	37.68	10.2	33.98	5.21
11.1	20.94	62.98	11.1	29.21	64.47	11.2	28.86	23.83	11.2	46.96	37.49	11.2	33.82	5.24
12.1	20.65	62.78	12.1	28.87	64.16	12.1	27.66	23.73	12.2	45.47	37.27	12.2	33.66	5.25
13.1	20.34	62.58	13.1	28.58	63.85	13.1	26.43	23.63	13.2	44.06	37.04	13.2	33.50	5.27
14.1	20.03	62.38	14.1	28.29	63.55	14.1	25.16	23.50	14.2	42.73	36.81	14.2	33.34	5.31
15.1	19.71	62.17	15.1	28.06	63.23	15.1	23.83	23.37	15.2	41.52	36.57	15.2	33.17	5.36
16.1	19.38	61.93	16.1	27.87	62.94	16.1	22.46	23.26	16.2	40.42	36.34	16.2	33.00	5.39
17.1	19.04	61.68	17.1	27.70	62.64	17.1	21.06	23.10	17.2	39.41	36.11	17.2	32.82	5.40
18.1	18.71	61.40	18.1	27.54	62.38	18.1	19.65	22.92	18.2	38.44	35.92	18.2	32.64	5.39
19.1	18.40	61.11	19.1	27.36	62.13	19.1	18.28	22.71	19.1	37.46	35.71	19.2	32.46	5.35
20.1	18.11	60.80	20.1	27.17	61.89	20.1	16.99	22.49	20.1	36.44	35.51	20.2	32.27	5.30
21.1	17.85	60.48	21.1	26.94	61.65	21.1	15.78	22.27	21.1	35.33	35.33	21.2	32.09	5.21
22.1	17.61	60.20	22.1	26.68	61.37	22.1	14.66	22.05	22.1	34.13	35.13	22.2	31.92	5.12
23.1	17.38	59.91	23.1	26.43	61.07	23.1	13.62	21.85	23.1	32.88	34.90	23.2	31.77	5.06
24.1	17.16	59.65	24.1	26.17	60.75	24.1	12.62	21.65	24.1	31.60	34.64	24.2	31.61	4.99
25.1	16.94	59.42	25.1	25.96	60.41	25.1	11.61	21.47	25.1	30.37	34.36	25.2	31.47	4.93
26.1	16.72	59.18	26.1	25.78	60.05	26.1	10.56	21.30	26.1	29.23	34.07	26.2	31.32	4.89
27.1	16.46	58.95	27.1	25.66	59.68	27.1	9.46	21.13	27.1	28.21	33.75	27.2	31.18	4.85
28.1	16.19	58.70	28.1	25.56	59.34	28.1	8.30	20.97	28.1	27.33	33.44	28.2	31.02	4.81
29.1	15.93	58.43	29.1	25.51	58.99	29.1	7.11	20.78	29.1	26.54	33.14	29.2	30.85	4.77
30.1	15.68	58.14	30.1	25.45	58.70	30.1	5.90	20.56	30.1	25.82	32.86	30.2	30.68	4.70
31.1	15.43	57.83	31.1	25.40	58.40	31.1	4.72	20.32	31.1	25.13	32.59	31.2	30.51	4.61
32.1	15.20	57.50	32.1	25.34	58.10	32.1	3.59	20.06	32.1	24.41	32.33	32.2	30.33	4.51
16.95	+16.92		24.57	-24.55		58.66	+58.65		74.11	-74.10		7.40	+7.33	
17 ^h 59 ^m	1° 30'7"		18 ^h 6 ^m	11° 89'3"		19 ^h 2 ^m	39° 6'24"		19 ^h 27 ^m	42° 2'18"		20 ^h 48 ^m	40° 49'4"	
+86° 36'	51° 17'		-87° 39'	51° 17' 82"		+89° 1'	2° 17'		-89° 13'	28° 57'		+82° 13'	29° 86"	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "	Nov.	h m	° ' "
	21 38	-83 6		22 16	-86 23		22 37	-81 48		23 27	+86 51		23 47	-82 28
	s	"		s	"		s	"		s	"		s	"
1.3	33.26	6.76	1.3	31.46	24.24	1.3	50.89	57.19	1.4	58.20	36.75	1.4	28.01	38.23
2.3	33.11	6.77	2.3	31.16	24.31	2.3	50.77	57.28	2.4	57.94	37.09	2.4	27.92	38.41
3.3	32.97	6.81	3.3	30.88	24.38	3.3	50.64	57.37	3.4	57.66	37.41	3.4	27.81	38.60
4.3	32.82	6.86	4.3	30.60	24.48	4.3	50.53	57.50	4.4	57.35	37.70	4.4	27.71	38.78
5.3	32.67	6.91	5.3	30.31	24.58	5.3	50.41	57.62	5.4	57.02	37.99	5.4	27.60	38.97
6.3	32.50	6.96	6.3	30.00	24.68	6.3	50.30	57.74	6.4	56.69	38.26	6.4	27.49	39.18
7.3	32.34	7.02	7.3	29.69	24.77	7.3	50.17	57.88	7.3	56.37	38.49	7.4	27.38	39.39
8.3	32.16	7.08	8.3	29.37	24.87	8.3	50.03	58.02	8.3	56.05	38.73	8.4	27.25	39.61
9.3	31.98	7.13	9.3	29.03	24.97	9.3	49.88	58.15	9.3	55.74	38.96	9.4	27.11	39.83
10.3	31.79	7.15	10.3	28.66	25.07	10.3	49.73	58.28	10.3	55.45	39.19	10.4	26.97	40.05
11.3	31.59	7.16	11.3	28.29	25.14	11.3	49.56	58.38	11.3	55.17	39.42	11.4	26.82	40.26
12.3	31.40	7.16	12.3	27.90	25.18	12.3	49.40	58.47	12.3	54.90	39.66	12.3	26.65	40.46
13.3	31.21	7.13	13.3	27.52	25.21	13.3	49.24	58.55	13.3	54.63	39.90	13.3	26.49	40.64
14.3	31.01	7.09	14.3	27.16	25.22	14.3	49.08	58.60	14.3	54.36	40.16	14.3	26.34	40.78
15.3	30.83	7.04	15.3	26.80	25.21	15.3	48.93	58.63	15.3	54.08	40.40	15.3	26.19	40.92
16.2	30.68	6.96	16.3	26.47	25.17	16.3	48.80	58.63	16.3	53.77	40.69	16.3	26.04	41.04
17.2	30.53	6.89	17.3	26.15	25.14	17.3	48.67	58.64	17.3	53.43	40.95	17.3	25.91	41.14
18.2	30.38	6.83	18.3	25.86	25.12	18.3	48.54	58.67	18.3	53.07	41.22	18.3	25.77	41.24
19.2	30.24	6.78	19.3	25.57	25.12	19.3	48.42	58.70	19.3	52.69	41.45	19.3	25.65	41.35
20.2	30.10	6.74	20.3	25.27	25.12	20.3	48.30	58.74	20.3	52.28	41.65	20.3	25.52	41.47
21.2	29.94	6.71	21.3	24.96	25.13	21.3	48.17	58.78	21.3	51.90	41.85	21.3	25.39	41.61
22.2	29.77	6.68	22.3	24.64	25.14	22.3	48.03	58.84	22.3	51.52	42.02	22.3	25.25	41.74
23.2	29.59	6.64	23.3	24.28	25.15	23.3	47.86	58.90	23.3	51.18	42.18	23.3	25.09	41.88
24.2	29.39	6.58	24.3	23.90	25.15	24.3	47.70	58.94	24.3	50.85	42.35	24.3	24.92	42.02
25.2	29.20	6.50	25.2	23.51	25.11	25.3	47.53	58.94	25.3	50.53	42.50	25.3	24.74	42.15
26.2	29.01	6.38	26.2	23.13	25.05	26.3	47.36	58.92	26.3	50.24	42.66	26.3	24.57	42.25
27.2	28.83	6.24	27.2	22.75	24.96	27.3	47.20	58.88	27.3	49.93	42.86	27.3	24.39	42.33
28.2	28.66	6.07	28.2	22.40	24.86	28.3	47.05	58.82	28.3	49.61	43.06	28.3	24.23	42.39
29.2	28.52	5.92	29.2	22.08	24.75	29.3	46.92	58.76	29.3	49.25	43.26	29.3	24.06	42.42
30.2	28.38	5.78	30.2	21.77	24.65	30.3	46.78	58.68	30.3	48.88	43.47	30.3	23.92	42.44
31.2	28.24	5.65	31.2	21.49	24.54	31.2	46.66	58.62	31.3	48.47	43.65	31.3	23.78	42.47
32.2	28.11	5.55	32.2	21.20	24.46	32.2	46.53	58.58	32.3	48.06	43.78	32.3	23.64	42.50
8.33	-8.27		15.88	-15.85		7.02	-6.95		18.26	+18.24		7.64	-7.57	
21 ^h 38 ^m 19 ^s .542			22 ^h 16 ^m 8 ^s .656			22 ^h 37 ^m 39 ^s .016			23 ^h 27 ^m 44 ^s .125			23 ^h 47 ^m 16 ^s .424		
-88° 6' 6".99			-86° 23' 27".13			-81° 49' 2".34			+86° 50' 58".89			-82° 28' 48".42		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursae Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m 0 57	° ' +85 49	Dec.	h m 1 31	° ' +88 52	Dec.	h m 1 42	° ' -85 11	Dec.	h m 4 10	° ' +85 20	Dec.	h m 5 35	° ' +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.3	29.23	26.27	0.4	35.78	21.42	0.4	9.19	12.85	0.5	40.89	24.68	0.5	51.61	29.38
1.3	29.01	26.56	1.4	35.11	21.75	1.4	8.99	13.03	1.5	40.95	25.06	1.5	51.77	28.70
2.3	28.79	26.83	2.4	34.39	22.05	2.4	8.80	13.21	2.5	40.99	25.44	2.5	51.92	29.03
3.3	28.55	27.07	3.4	33.61	22.34	3.4	8.62	13.41	3.5	41.01	25.81	3.5	52.05	29.36
4.3	28.30	27.31	4.4	32.81	22.63	4.4	8.43	13.59	4.5	41.02	26.16	4.5	52.15	29.69
5.3	28.05	27.53	5.4	32.00	22.88	5.4	8.24	13.80	5.5	41.02	26.50	5.5	52.25	30.01
6.3	27.81	27.73	6.4	31.22	23.13	6.4	8.04	14.01	6.5	41.00	26.84	6.5	52.34	30.32
7.3	27.58	27.92	7.3	30.46	23.36	7.4	7.81	14.21	7.5	40.99	27.15	7.5	52.41	30.62
8.3	27.36	28.10	8.3	29.73	23.57	8.4	7.58	14.42	8.5	40.98	27.44	8.5	52.49	30.90
9.3	27.16	28.29	9.3	29.03	23.80	9.4	7.34	14.63	9.5	40.97	27.73	9.5	52.58	31.18
10.3	26.95	28.47	10.3	28.38	24.02	10.4	7.08	14.82	10.5	40.97	28.01	10.5	52.67	31.45
11.3	26.75	28.66	11.3	27.72	24.26	11.3	6.81	14.97	11.5	40.99	28.32	11.5	52.77	31.72
12.3	26.55	28.86	12.3	27.07	24.53	12.3	6.54	15.12	12.4	41.00	28.63	12.5	52.88	32.00
13.3	26.36	29.09	13.3	26.39	24.79	13.3	6.29	15.25	13.4	41.04	28.96	13.5	53.01	32.31
14.3	26.13	29.33	14.3	25.65	25.06	14.3	6.04	15.35	14.4	41.05	29.31	14.5	53.13	32.62
15.3	25.89	29.55	15.3	24.82	25.33	15.3	5.80	15.45	15.4	41.06	29.63	15.5	53.24	32.96
16.3	25.61	29.75	16.3	23.92	25.61	16.3	5.57	15.53	16.4	41.03	30.05	16.5	53.34	33.32
17.3	25.33	29.95	17.3	22.95	25.86	17.3	5.35	15.62	17.4	41.00	30.43	17.5	53.41	33.69
18.3	25.04	30.13	18.3	21.93	26.07	18.3	5.13	15.71	18.4	40.94	30.77	18.5	53.45	34.04
19.3	24.75	30.27	19.3	20.93	26.27	19.3	4.91	15.84	19.4	40.86	31.10	19.5	53.49	34.38
20.3	24.46	30.40	20.3	19.95	26.45	20.3	4.67	15.97	20.4	40.77	31.40	20.5	53.49	34.72
21.3	24.21	30.50	21.3	19.04	26.59	21.3	4.40	16.11	21.4	40.68	31.69	21.5	53.51	35.02
22.3	23.97	30.60	22.3	18.19	26.74	22.3	4.13	16.25	22.4	40.63	31.95	22.5	53.52	35.28
23.3	23.74	30.71	23.3	17.39	26.89	23.3	3.85	16.36	23.4	40.57	32.22	23.5	53.56	35.55
24.3	23.52	30.84	24.3	16.62	27.07	24.3	3.54	16.46	24.4	40.53	32.48	24.5	53.60	35.81
25.3	23.29	30.97	25.3	15.84	27.24	25.3	3.25	16.51	25.4	40.49	32.75	25.5	53.66	36.11
26.3	23.06	31.12	26.3	15.01	27.44	26.3	2.97	16.57	26.4	40.45	33.06	26.5	53.71	36.40
27.3	22.80	31.27	27.3	14.11	27.64	27.3	2.69	16.60	27.4	40.41	33.37	27.5	53.77	36.72
28.3	22.53	31.40	28.3	13.13	27.84	28.3	2.42	16.61	28.4	40.33	33.69	28.5	53.81	37.07
29.3	22.24	31.54	29.3	12.07	28.02	29.3	2.18	16.62	29.4	40.24	34.02	29.5	53.83	37.42
30.3	21.93	31.63	30.3	10.97	28.17	30.3	1.94	16.62	30.4	40.14	34.34	30.5	53.82	37.78
31.3	21.62	31.72	31.3	9.86	28.31	31.3	1.69	16.67	31.4	40.01	34.65	31.5	53.79	38.13
13.74	+13.70		50.87	+50.86		11.92	-11.88		12.31	+12.27		11.85	+11.81	
0 ^h 57 ^m	9 ^s .300		1 ^h 30 ^m	13 ^s .156		1 ^h 42 ^m	2 ^s .339		4 ^h 10 ^m	2 ^s .561		5 ^h 35 ^m	12 ^s .782	
+85° 48' 45".30			+88° 51' 43".55			-85° 11' 21".46			+85° 20' 10".34			+85° 9' 30".24		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensse. Mag. 6.2			ζ Mensse. Mag. 5.6			51 H. Cephei. Mag. 5.3			25 H. Camelop. Mag. 5.1			7 G. Octantis. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	s	Dec.	h m	s	Dec.	h m	s	Dec.	h m	s	Dec.	h m	s
	5 46	-84 49		6 46	-80 43		7 3	+87 10		7 14	+82 34		7 16	-86 54
0.5	14.65	39.32	0.6	59.55	32.19	0.6	2.58	36.42	0.6	6.39	10.16	0.6	14.57	1.97
1.5	14.67	39.63	1.6	59.60	32.49	1.6	3.01	36.64	1.6	6.57	10.37	1.6	14.75	2.26
2.5	14.70	39.94	2.6	59.66	32.79	2.6	3.40	36.89	2.6	6.73	10.59	2.6	14.93	2.53
3.5	14.73	40.25	3.6	59.72	33.08	3.6	3.76	37.17	3.6	6.88	10.82	3.6	15.12	2.80
4.5	14.78	40.56	4.6	59.78	33.38	4.6	4.10	37.43	4.6	7.02	11.06	4.6	15.32	3.08
5.5	14.82	40.89	5.6	59.83	33.69	5.6	4.42	37.69	5.6	7.15	11.30	5.6	15.53	3.35
6.5	14.86	41.24	6.6	59.89	34.01	6.6	4.71	37.94	6.6	7.28	11.53	6.6	15.75	3.64
7.5	14.89	41.60	7.6	59.95	34.36	7.6	4.99	38.19	7.6	7.39	11.76	7.6	15.96	3.96
8.5	14.91	41.96	8.6	60.01	34.72	8.6	5.27	38.42	8.6	7.50	11.97	8.6	16.16	4.29
9.5	14.92	42.36	9.6	60.06	35.10	9.6	5.55	38.64	9.6	7.62	12.17	9.6	16.35	4.64
10.5	14.93	42.75	10.6	60.10	35.50	10.6	5.84	38.86	10.6	7.75	12.36	10.6	16.53	5.01
11.5	14.93	43.13	11.6	60.15	35.89	11.6	6.14	39.09	11.6	7.87	12.56	11.6	16.68	5.37
12.5	14.89	43.51	12.6	60.18	36.28	12.6	6.46	39.31	12.6	7.99	12.75	12.6	16.81	5.73
13.5	14.85	43.88	13.6	60.20	36.67	13.6	6.80	39.54	13.6	8.15	12.97	13.6	16.91	6.10
14.5	14.81	44.22	14.6	60.22	37.03	14.6	7.14	39.80	14.6	8.30	13.19	14.6	16.99	6.44
15.5	14.76	44.55	15.5	60.24	37.37	15.6	7.49	40.07	15.6	8.45	13.45	15.6	17.05	6.78
16.5	14.71	44.87	16.5	60.26	37.70	16.6	7.82	40.37	16.6	8.59	13.72	16.6	17.11	7.10
17.5	14.67	45.17	17.5	60.27	38.02	17.6	8.11	40.69	17.6	8.71	14.00	17.6	17.19	7.40
18.5	14.64	45.49	18.5	60.29	38.35	18.6	8.36	41.00	18.6	8.82	14.29	18.6	17.27	7.70
19.5	14.61	45.81	19.5	60.31	38.68	19.5	8.58	41.30	19.6	8.92	14.59	19.6	17.37	8.01
20.5	14.58	46.14	20.5	60.33	39.03	20.5	8.77	41.59	20.6	9.01	14.87	20.6	17.48	8.34
21.5	14.55	46.51	21.5	60.35	39.41	21.5	8.94	41.87	21.6	9.08	15.12	21.6	17.60	8.70
22.5	14.51	46.90	22.5	60.37	39.81	22.5	9.11	42.12	22.5	9.16	15.36	22.5	17.70	9.07
23.5	14.45	47.29	23.5	60.39	40.22	23.5	9.30	42.36	23.5	9.25	15.59	23.5	17.77	9.46
24.5	14.37	47.68	24.5	60.40	40.64	24.5	9.51	42.61	24.5	9.33	15.82	24.5	17.83	9.87
25.5	14.28	48.05	25.5	60.40	41.04	25.5	9.73	42.87	25.5	9.44	16.04	25.5	17.85	10.27
26.5	14.17	48.42	26.5	60.39	41.43	26.5	9.98	43.14	26.5	9.55	16.29	26.5	17.85	10.65
27.5	14.07	48.75	27.5	60.38	41.80	27.5	10.21	43.43	27.5	9.65	16.55	27.5	17.82	11.02
28.5	13.97	49.07	28.5	60.36	42.15	28.5	10.44	43.75	28.5	9.75	16.84	28.5	17.79	11.37
29.5	13.86	49.36	29.5	60.34	42.49	29.5	10.65	44.09	29.5	9.85	17.15	29.5	17.76	11.71
30.5	13.76	49.67	30.5	60.33	42.82	30.5	10.83	44.43	30.5	9.94	17.47	30.5	17.75	12.03
31.5	13.67	49.98	31.5	60.32	43.16	31.5	10.97	44.78	31.5	10.00	17.79	31.5	17.74	12.37
11.10	-11.05		6.20	-6.12		20.31	+20.28		7.73	+7.67		18.50	-18.48	
5 ^h 46 ^m 14 ^s .756			6 ^h 46 ^m 58 ^s .546			7 ^h 2 ^m 4 ^s .048			7 ^h 13 ^m 42 ^s .294			7 ^h 16 ^m 20 ^s .292		
-84° 49' 46".89			-80° 43' 38".16			+87° 10' 54".74			+82° 34' 30".13			-86° 54' 6".70		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "
0.7	42.95	30.02	0.7	54.34	56.84	0.7	35.65	3.50	0.7	22.58	7.29	0.7	15.22	11.80
1.7	44.21	30.16	1.7	54.55	57.04	1.7	35.85	3.49	1.7	22.71	7.48	1.7	15.45	11.71
2.6	45.41	30.31	2.7	54.76	57.22	2.7	36.03	3.52	2.7	22.83	7.62	2.7	15.67	11.65
3.6	46.56	30.48	3.7	54.98	57.40	3.7	36.22	3.56	3.7	22.95	7.77	3.7	15.87	11.61
4.6	47.65	30.66	4.7	55.21	57.58	4.7	36.39	3.60	4.7	23.08	7.92	4.7	16.08	11.60
5.6	48.68	30.83	5.7	55.44	57.75	5.7	36.55	3.66	5.7	23.20	8.06	5.7	16.27	11.59
6.6	49.64	31.01	6.7	55.68	57.93	6.7	36.70	3.74	6.7	23.33	8.22	6.7	16.47	11.58
7.6	50.57	31.19	7.7	55.93	58.13	7.7	36.86	3.81	7.7	23.46	8.41	7.7	16.64	11.57
8.6	51.47	31.34	8.7	56.17	58.36	8.7	36.99	3.87	8.7	23.60	8.61	8.7	16.82	11.56
9.6	52.37	31.49	9.7	56.41	58.59	9.7	37.14	3.92	9.7	23.74	8.83	9.7	16.99	11.54
10.6	53.29	31.63	10.7	56.66	58.86	10.7	37.28	3.97	10.7	23.87	9.06	10.7	17.17	11.51
11.6	54.24	31.78	11.7	56.90	59.13	11.7	37.44	4.02	11.7	24.00	9.33	11.7	17.34	11.48
12.6	55.24	31.91	12.7	57.11	59.42	12.7	37.61	4.04	12.7	24.13	9.59	12.7	17.54	11.43
13.6	56.30	32.08	13.7	57.31	59.71	13.7	37.78	4.08	13.7	24.25	9.86	13.7	17.73	11.38
14.6	57.38	32.24	14.7	57.50	60.00	14.7	37.96	4.12	14.7	24.36	10.13	14.7	17.96	11.33
15.6	58.49	32.43	15.6	57.67	60.29	15.7	38.14	4.20	15.7	24.47	10.40	15.7	18.17	11.33
16.6	59.58	32.64	16.6	57.84	60.56	16.7	38.33	4.30	16.7	24.58	10.64	16.7	18.40	11.33
17.6	60.61	32.88	17.6	58.00	60.81	17.7	38.50	4.42	17.7	24.67	10.89	17.7	18.62	11.37
18.6	61.55	33.14	18.6	58.17	61.04	18.7	38.66	4.56	18.7	24.77	11.12	18.7	18.82	11.43
19.6	62.40	33.37	19.6	58.35	61.28	19.7	38.81	4.71	19.7	24.87	11.35	19.7	19.01	11.51
20.6	63.15	33.62	20.6	58.54	61.55	20.6	38.95	4.85	20.7	24.98	11.59	20.7	19.19	11.59
21.6	63.86	33.86	21.6	58.74	61.83	21.6	39.08	4.99	21.6	25.10	11.86	21.7	19.36	11.65
22.6	64.55	34.06	22.6	58.94	62.13	22.6	39.20	5.12	22.6	25.23	12.13	22.7	19.52	11.70
23.6	65.27	34.26	23.6	59.15	62.44	23.6	39.33	5.22	23.6	25.35	12.45	23.7	19.68	11.75
24.6	66.02	34.46	24.6	59.34	62.78	24.6	39.47	5.31	24.6	25.45	12.77	24.7	19.84	11.78
25.6	66.84	34.64	25.6	59.51	63.15	25.6	39.61	5.40	25.6	25.56	13.11	25.7	20.03	11.82
26.6	67.68	34.84	26.6	59.66	63.52	26.6	39.76	5.51	26.6	25.66	13.44	26.7	20.21	11.85
27.6	68.56	35.07	27.6	59.80	63.86	27.6	39.92	5.64	27.6	25.76	13.77	27.7	20.42	11.90
28.6	69.43	35.33	28.6	59.93	64.19	28.6	40.08	5.78	28.6	25.84	14.10	28.7	20.62	11.98
29.6	70.25	35.60	29.6	60.03	64.51	29.6	40.24	5.96	29.6	25.93	14.40	29.7	20.83	12.07
30.6	71.03	35.88	30.6	60.15	64.80	30.6	40.38	6.14	30.6	26.00	14.71	30.7	21.02	12.18
31.6	71.73	36.17	31.6	60.28	65.10	31.6	40.52	6.33	31.6	26.08	14.99	31.7	21.21	12.33
50.96	+50.95		12.29	-12.25		6.91	+6.84		6.10	-6.02		8.17	+8.11	
8 ^h 15 ^m 48 ^s .380			9 ^h 8 ^m 57 ^s .938			9 ^h 25 ^m 21 ^s .719			9 ^h 36 ^m 22 ^s .347			10 ^h 21 ^m 4 ^s .831		
+88° 53' 0'' .29			-85° 19' 57'' .45			+81° 41' 41'' .50			-80° 34' 6'' .83			+82° 58' 54'' .07		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

7 Octantis. Mag. 6.3			Bradley 1673. Mag. 6.3			1 Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "
	10 59	-84 8		12 14	+88 8		12 46	-84 40		12 48	+83 51		13 27	-85 21
0.8	53.77	54.27	0.8	12.48	52.77	0.8	7.04	29.18	0.8	24.37	9.31	0.9	14.92	49.99
1.8	53.97	54.33	1.8	13.13	52.53	1.8	7.25	29.10	1.8	24.55	9.02	1.9	15.16	49.86
2.8	54.18	54.38	2.8	13.79	52.31	2.8	7.47	29.02	2.8	24.73	8.74	2.9	15.39	49.71
3.8	54.39	54.42	3.8	14.46	52.12	3.8	7.67	28.93	3.8	24.92	8.48	3.9	15.60	49.57
4.8	54.59	54.45	4.8	15.12	51.94	4.8	7.89	28.83	4.8	25.11	8.24	4.9	15.82	49.41
5.8	54.81	54.47	5.8	15.77	51.77	5.8	8.11	28.71	5.8	25.29	8.03	5.9	16.05	49.24
6.7	55.04	54.50	6.8	16.39	51.61	6.8	8.34	28.60	6.8	25.46	7.83	6.9	16.29	49.07
7.7	55.27	54.55	7.8	16.98	51.45	7.8	8.57	28.49	7.8	25.63	7.62	7.8	16.55	48.90
8.7	55.51	54.63	8.8	17.55	51.31	8.8	8.84	28.38	8.8	25.80	7.43	8.8	16.82	48.74
9.7	55.76	54.71	9.8	18.11	51.16	9.8	9.10	28.29	9.8	25.95	7.22	9.8	17.10	48.59
10.7	56.01	54.80	10.8	18.66	50.99	10.8	9.37	28.22	10.8	26.10	7.02	10.8	17.41	48.45
11.7	56.26	54.92	11.8	19.22	50.82	11.8	9.66	28.18	11.8	26.26	6.81	11.8	17.71	48.34
12.7	56.51	55.07	12.8	19.80	50.63	12.8	9.94	28.16	12.8	26.43	6.58	12.8	18.03	48.25
13.7	56.74	55.24	13.8	20.40	50.45	13.8	10.22	28.16	13.8	26.61	6.34	13.8	18.32	48.19
14.7	56.96	55.40	14.8	21.07	50.26	14.8	10.48	28.17	14.8	26.81	6.10	14.8	18.62	48.13
15.7	57.16	55.55	15.8	21.78	50.08	15.8	10.73	28.19	15.8	27.02	5.87	15.8	18.90	48.08
16.7	57.36	55.71	16.8	22.52	49.92	16.8	10.97	28.21	16.8	27.24	5.65	16.8	19.17	48.04
17.7	57.55	55.86	17.8	23.27	49.79	17.8	11.20	28.21	17.8	27.45	5.45	17.8	19.42	47.99
18.7	57.75	55.98	18.8	24.02	49.69	18.8	11.43	28.19	18.8	27.67	5.27	18.8	19.67	47.93
19.7	57.94	56.10	19.8	24.73	49.60	19.8	11.66	28.16	19.8	27.88	5.12	19.8	19.93	47.85
20.7	58.17	56.24	20.8	25.38	49.52	20.8	11.90	28.14	20.8	28.07	4.99	20.8	20.21	47.75
21.7	58.39	56.38	21.8	26.01	49.46	21.8	12.18	28.12	21.8	28.26	4.88	21.8	20.51	47.66
22.7	58.63	56.55	22.8	26.61	49.39	22.8	12.46	28.10	22.8	28.44	4.76	22.8	20.82	47.59
23.7	58.87	56.74	23.8	27.18	49.31	23.8	12.75	28.11	23.8	28.61	4.63	23.8	21.15	47.54
24.7	59.11	56.96	24.8	27.76	49.22	24.8	13.05	28.15	24.8	28.79	4.48	24.8	21.49	47.51
25.7	59.34	57.18	25.8	28.37	49.12	25.8	13.35	28.22	25.8	28.97	4.32	25.8	21.83	47.50
26.7	59.55	57.42	26.8	29.03	49.01	26.8	13.63	28.30	26.8	29.17	4.15	26.8	22.16	47.51
27.7	59.75	57.66	27.8	29.73	48.91	27.8	13.90	28.38	27.8	29.39	4.00	27.8	22.47	47.55
28.7	59.94	57.89	28.8	30.46	48.82	28.8	14.15	28.47	28.8	29.61	3.85	28.8	22.76	47.58
29.7	60.12	58.12	29.8	31.22	48.76	29.8	14.39	28.55	29.8	29.83	3.72	29.8	23.05	47.60
30.7	60.29	58.33	30.8	31.98	48.72	30.8	14.63	28.64	30.8	30.07	3.62	30.8	23.32	47.62
31.7	60.47	58.53	31.8	32.73	48.70	31.8	14.86	28.71	31.8	30.30	3.53	31.8	23.59	47.62
9.81	-9.76		30.93	+30.91		10.77	-10.73		9.34	+9.28		12.37	-12.33	
10 ^h 59 ^m 55 ^s .280			12 ^h 14 ^m 28 ^s .425			12 ^h 46 ^m 7 ^s .152			12 ^h 48 ^m 30 ^s .418			13 ^h 27 ^m 14 ^s .624		
-84° 8' 50".60			+88° 9' 36".08			-84° 40' 22".34			+83° 51' 50".47			-85° 21' 42".23		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2233. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m s	° ' "	"	h m s	° ' "	"	h m s	° ' "	"	h m s	° ' "	"	h m s	° ' "	"
Dec. 14 13	-83 17	"	Dec. 15 2	+87 32	"	Dec. 15 24	-84 11	"	Dec. 16 54	+82 10	"	Dec. 17 16	-80 47	"
0.9	30.10	29.35	0.9	48.48	44.85	0.9	0.60	38.97	1.0	7.82	27.13	1.0	0.43	13.82
1.9	30.25	29.18	1.9	48.61	44.47	1.9	0.72	38.73	2.0	7.77	26.76	2.0	0.45	13.55
2.9	30.38	28.98	2.9	48.75	44.08	2.9	0.82	38.49	3.0	7.74	26.37	3.0	0.47	13.29
3.9	30.52	28.80	3.9	48.93	43.72	3.9	0.92	38.24	4.0	7.72	25.98	4.0	0.48	13.02
4.9	30.64	28.61	4.9	49.12	43.38	4.9	1.02	37.98	4.9	7.70	25.61	5.0	0.48	12.73
5.9	30.78	28.39	5.9	49.31	43.05	5.9	1.13	37.72	5.9	7.68	25.25	6.0	0.48	12.42
6.9	30.93	28.18	6.9	49.50	42.73	6.9	1.25	37.43	6.9	7.67	24.91	7.0	0.49	12.11
7.9	31.09	27.96	7.9	49.69	42.42	7.9	1.37	37.13	7.9	7.66	24.58	8.0	0.50	11.78
8.9	31.26	27.74	8.9	49.87	42.14	8.9	1.50	36.84	8.9	7.65	24.25	9.0	0.51	11.42
9.9	31.43	27.54	9.9	50.02	41.83	9.9	1.65	36.54	9.9	7.63	23.94	10.0	0.55	11.08
10.9	31.62	27.34	10.9	50.17	41.53	10.9	1.82	36.25	10.9	7.60	23.62	10.9	0.59	10.74
11.9	31.81	27.16	11.9	50.32	41.23	11.9	2.00	35.97	11.9	7.58	23.30	11.9	0.64	10.41
12.9	32.01	27.01	12.9	50.46	40.90	12.9	2.19	35.74	12.9	7.57	22.95	12.9	0.70	10.07
13.9	32.23	26.88	13.9	50.63	40.56	13.9	2.38	35.51	13.9	7.56	22.60	13.9	0.77	9.76
14.9	32.43	26.78	14.9	50.81	40.22	14.9	2.57	35.32	14.9	7.54	22.23	14.9	0.85	9.48
15.9	32.61	26.69	15.9	51.04	39.85	15.9	2.76	35.13	15.9	7.53	21.84	15.9	0.92	9.21
16.9	32.80	26.59	16.9	51.31	39.50	16.9	2.93	34.96	16.9	7.53	21.44	16.9	0.97	8.95
17.9	32.97	26.48	17.9	51.61	39.17	17.9	3.09	34.77	17.9	7.56	21.03	17.9	1.03	8.69
18.9	33.13	26.35	18.9	51.92	38.85	18.9	3.24	34.58	18.9	7.58	20.66	18.9	1.08	8.42
19.8	33.29	26.22	19.9	52.24	38.55	19.9	3.39	34.36	19.9	7.61	20.29	19.9	1.12	8.14
20.8	33.46	26.07	20.9	52.55	38.27	20.9	3.56	34.13	20.9	7.65	19.96	20.9	1.16	7.82
21.8	33.65	25.92	21.9	52.84	38.03	21.9	3.73	33.87	21.9	7.68	19.65	21.9	1.21	7.51
22.8	33.87	25.77	22.9	53.10	37.78	22.9	3.92	33.62	22.9	7.70	19.34	22.9	1.27	7.18
23.8	34.09	25.64	23.9	53.34	37.52	23.9	4.14	33.40	23.9	7.72	19.03	23.9	1.35	6.85
24.8	34.32	25.55	24.9	53.58	37.26	24.9	4.37	33.20	24.9	7.74	18.72	24.9	1.44	6.52
25.8	34.55	25.48	25.9	53.82	37.00	25.9	4.61	33.00	25.9	7.75	18.39	25.9	1.53	6.21
26.8	34.77	25.42	26.9	54.09	36.72	26.9	4.84	32.83	26.9	7.76	18.06	26.9	1.64	5.93
27.8	35.00	25.37	27.9	54.39	36.42	27.9	5.07	32.69	27.9	7.80	17.69	27.9	1.75	5.67
28.8	35.19	25.34	28.9	54.73	36.13	28.9	5.28	32.56	28.9	7.85	17.31	28.9	1.84	5.43
29.8	35.39	25.32	29.9	55.10	35.83	29.9	5.48	32.43	29.9	7.89	16.93	29.9	1.93	5.20
30.8	35.58	25.27	30.9	55.49	35.55	30.9	5.68	32.30	30.9	7.94	16.57	30.9	2.02	4.96
31.8	35.76	25.23	31.9	55.90	35.28	31.9	5.87	32.15	31.9	8.00	16.21	31.9	2.10	4.70
8.56	-8.50		23.34	+23.32		9.88	-9.83		7.34	+7.27		6.24	-6.16	
14 ^h 13 ^m	27°.793		15 ^h 3 ^m	41°.175		16 ^h 23 ^m	56°.594		16 ^h 54 ^m	25°.488		17 ^h 15 ^m	54°.896	
-83° 17'	21''.03		+87° 33'	10''.52		-84° 11'	30''.39		+82° 10'	32''.75		-80° 47'	6''.56	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursae Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursae Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m ° ' "		Dec.	h m ° ' "		Dec.	h m ° ' "		Dec.	h m ° ' "		Dec.	h m ° ' "	
1.1	15.43 57.83	1.1	25.40 58.40	1.1	64.72 20.32	1.1	25.13 32.59	1.2	30.51 64.61					
2.1	15.20 57.50	2.1	25.34 58.10	2.1	63.59 20.06	2.1	24.41 32.33	2.2	30.33 64.51					
3.0	15.00 57.16	3.1	25.26 57.81	3.1	62.55 19.79	3.1	23.66 32.07	3.2	30.18 64.37					
4.0	14.81 56.81	4.1	25.17 57.54	4.1	61.58 19.52	4.1	22.84 31.81	4.2	30.02 64.23					
5.0	14.66 56.47	5.0	25.06 57.22	5.1	60.68 19.24	5.1	21.98 31.55	5.2	29.86 64.07					
6.0	14.50 56.14	6.0	24.93 56.90	6.1	59.84 18.96	6.1	21.10 31.28	6.2	29.71 63.90					
7.0	14.36 55.83	7.0	24.82 56.56	7.1	59.06 18.69	7.1	20.18 31.00	7.2	29.56 63.74					
8.0	14.22 55.52	8.0	24.71 56.22	8.1	58.29 18.43	8.1	19.28 30.69	8.2	29.43 63.59					
9.0	14.09 55.23	9.0	24.65 55.86	9.1	57.54 18.20	9.1	18.44 30.35	9.2	29.29 63.44					
10.0	13.96 54.95	10.0	24.59 55.48	10.1	56.76 17.98	10.1	17.65 30.01	10.1	29.17 63.31					
11.0	13.82 54.68	11.0	24.59 55.11	11.1	55.97 17.76	11.1	16.96 29.67	11.1	29.03 63.21					
12.0	13.67 54.40	12.0	24.62 54.73	12.1	55.14 17.53	12.1	16.37 29.33	12.1	28.90 63.10					
13.0	13.49 54.11	13.0	24.69 54.38	13.1	54.25 17.30	13.1	15.92 28.98	13.1	28.76 62.97					
14.0	13.32 53.79	14.0	24.79 54.04	14.1	53.32 17.03	14.1	15.57 28.63	14.1	28.62 62.84					
15.0	13.17 53.45	15.0	24.90 53.71	15.1	52.41 16.76	15.1	15.30 28.29	15.1	28.46 62.67					
16.0	13.02 53.09	16.0	25.02 53.39	16.1	51.51 16.45	16.1	15.05 27.98	16.1	28.31 62.50					
17.0	12.88 52.72	17.0	25.12 53.11	17.1	50.68 16.13	17.1	14.78 27.69	17.1	28.17 62.29					
18.0	12.79 52.34	18.0	25.19 52.82	18.1	49.96 15.81	18.1	14.44 27.39	18.1	28.02 62.06					
19.0	12.73 51.97	19.0	25.24 52.51	19.0	49.32 15.47	19.1	14.03 27.10	19.1	27.88 61.83					
20.0	12.67 51.62	20.0	25.27 52.20	20.0	48.79 15.14	20.1	13.53 26.79	20.1	27.75 61.60					
21.0	12.63 51.28	21.0	25.29 51.85	21.0	48.33 14.84	21.1	13.02 26.46	21.1	27.64 61.37					
21.9	12.60 51.01	22.0	25.34 51.47	22.0	47.87 14.56	22.1	12.53 26.09	22.1	27.54 61.17					
22.9	12.56 50.72	22.9	25.44 51.10	23.0	47.41 14.32	23.1	12.11 25.73	23.1	27.44 60.99					
23.9	12.50 50.42	23.9	25.58 50.72	24.0	46.91 14.08	24.1	11.82 25.35	24.1	27.33 60.82					
24.9	12.44 50.13	24.9	25.75 50.36	25.0	46.35 13.82	25.1	11.65 24.95	25.1	27.22 60.64					
25.9	12.35 49.82	25.9	25.97 50.02	26.0	45.74 13.55	26.0	11.62 24.56	26.1	27.11 60.45					
26.9	12.28 49.49	26.9	26.21 49.68	27.0	45.12 13.26	27.0	11.66 24.20	27.1	27.00 60.25					
27.9	12.22 49.15	27.9	26.44 49.34	28.0	44.51 12.94	28.0	11.76 23.85	28.1	26.87 60.02					
28.9	12.17 48.78	28.9	26.67 49.06	29.0	43.97 12.61	29.0	11.86 23.53	29.1	26.74 59.78					
29.9	12.16 48.41	29.9	26.90 48.78	30.0	43.48 12.25	30.0	11.93 23.20	30.1	26.61 59.51					
30.9	12.15 48.03	30.9	27.09 48.49	31.0	43.10 11.89	31.0	11.95 22.88	31.1	26.51 59.23					
31.9	12.18 47.67	31.9	27.28 48.17	32.0	42.78 11.54	32.0	11.93 22.57	32.1	26.41 58.93					
16.94	+16.91	24.54	-24.52	58.55	+58.54	73.89	-73.88	7.40	+7.33					
17 ^h 59 ^m 1 ^s .307		18 ^h 6 ^m 11 ^s .893		19 ^h 2 ^m 39 ^s .624		19 ^h 27 ^m 42 ^s .218		20 ^h 48 ^m 40 ^s .494						
+86° 36' 51".17		-87° 39' 51".82		+89° 1' 2".17		-89° 13' 28".57		+82° 13' 29".86						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "	Dec.	h m	° ' "
	21 38	-83 5		22 16	-86 23		22 37	-81 48		23 27	+86 51		23 47	-82 28
1.2	28.24	65.65	1.2	21.49	24.54	1.2	46.66	58.62	1.3	48.47	43.65	1.3	23.78	42.47
2.2	28.11	65.55	2.2	21.20	24.46	2.2	46.53	58.58	2.3	48.06	43.78	2.3	23.64	42.50
3.2	27.98	65.44	3.2	20.93	24.38	3.2	46.41	58.54	3.3	47.65	43.92	3.3	23.50	42.55
4.2	27.83	65.34	4.2	20.60	24.31	4.2	46.28	58.51	4.3	47.23	44.03	4.3	23.36	42.60
5.2	27.68	65.23	5.2	20.28	24.25	5.2	46.14	58.48	5.3	46.82	44.13	5.3	23.20	42.66
6.2	27.51	65.10	6.2	19.94	24.18	6.2	45.99	58.45	6.3	46.43	44.21	6.3	23.04	42.72
7.2	27.34	64.97	7.2	19.60	24.10	7.2	45.84	58.41	7.3	46.05	44.29	7.3	22.86	42.79
8.2	27.17	64.82	8.2	19.24	24.00	8.2	45.69	58.35	8.3	45.68	44.36	8.3	22.69	42.85
9.2	26.99	64.65	9.2	18.88	23.87	9.2	45.52	58.27	9.3	45.32	44.45	9.3	22.51	42.89
10.2	26.82	64.47	10.2	18.52	23.73	10.2	45.36	58.18	10.3	44.99	44.54	10.3	22.33	42.90
11.2	26.67	64.27	11.2	18.18	23.57	11.2	45.21	58.06	11.3	44.65	44.61	11.3	22.14	42.90
12.2	26.52	64.04	12.2	17.84	23.39	12.2	45.06	57.93	12.3	44.32	44.72	12.3	21.97	42.86
13.2	26.39	63.81	13.2	17.52	23.20	13.2	44.91	57.77	13.3	43.94	44.83	13.3	21.80	42.82
14.2	26.26	63.57	14.2	17.24	23.02	14.2	44.79	57.62	14.2	43.55	44.94	14.3	21.64	42.76
15.2	26.15	63.35	15.2	16.99	22.82	15.2	44.68	57.47	15.2	43.14	45.04	15.3	21.50	42.68
16.2	26.05	63.13	16.2	16.74	22.61	16.2	44.58	57.30	16.2	42.72	45.14	16.3	21.36	42.62
17.2	25.95	62.93	17.2	16.49	22.43	17.2	44.46	57.15	17.2	42.27	45.20	17.3	21.22	42.56
18.2	25.83	62.74	18.2	16.22	22.29	18.2	44.34	57.04	18.2	41.81	45.23	18.2	21.08	42.52
19.2	25.71	62.56	19.2	15.96	22.14	19.2	44.22	56.94	19.2	41.38	45.24	19.2	20.93	42.49
20.2	25.58	62.37	20.2	15.64	21.97	20.2	44.09	56.82	20.2	40.98	45.24	20.2	20.76	42.47
21.2	25.44	62.16	21.2	15.32	21.80	21.2	43.96	56.69	21.2	40.60	45.22	21.2	20.59	42.43
22.2	25.30	61.93	22.2	15.02	21.61	22.2	43.80	56.55	22.2	40.23	45.21	22.2	20.41	42.39
23.1	25.15	61.67	23.2	14.69	21.40	23.2	43.65	56.37	23.2	39.90	45.23	23.2	20.23	42.32
24.1	25.01	61.39	24.2	14.38	21.15	24.2	43.51	56.16	24.2	39.57	45.24	24.2	20.05	42.23
25.1	24.90	61.10	25.2	14.09	20.88	25.2	43.38	55.93	25.2	39.23	45.27	25.2	19.87	42.11
26.1	24.79	60.80	26.2	13.82	20.61	26.2	43.26	55.70	26.2	38.86	45.31	26.2	19.71	41.97
27.1	24.70	60.51	27.2	13.59	20.35	27.2	43.16	55.46	27.2	38.46	45.34	27.2	19.57	41.83
28.1	24.62	60.23	28.2	13.37	20.10	28.2	43.05	55.23	28.2	38.05	45.35	28.2	19.42	41.69
29.1	24.55	59.96	29.2	13.16	19.85	29.2	42.96	55.04	29.2	37.63	45.34	29.2	19.28	41.56
30.1	24.47	59.70	30.2	12.96	19.61	30.2	42.87	54.83	30.2	37.20	45.30	30.2	19.15	41.43
31.1	24.38	59.45	31.2	12.74	19.39	31.2	42.76	54.63	31.2	36.77	45.25	31.2	19.01	41.31
32.1	24.30	59.20	32.1	12.52	19.16	32.2	42.66	54.45	32.2	36.35	45.19	32.2	18.87	41.19
8.32	-8.26		15.88	-15.85		7.02	-6.95		18.27	+18.24		7.64	-7.57	
21 ^h 38 ^m 19 ^s .542			22 ^h 16 ^m 8 ^s .656			22 ^h 37 ^m 39 ^s .016			23 ^h 27 ^m 44 ^s .125			23 ^h 47 ^m 16 ^s .424		
-83° 6'	6'' 99		-86° 23'	27'' 13		-81° 49'	2'' 34		+86° 50'	58'' 89		-82° 28'	48'' 42	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	33 Piscium. Mag. 4.7		α Andromedæ. (Alpheratz.) Mag. 2.2		β Cassiopeiæ. Mag. 2.4		ϵ Phœnicis. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 1	° ' " - 6 9	h m 0 4	° ' " +28 37	h m 0 4	° ' " +58 41	h m 0 5	° ' " -46 11
Jan. 0.2	6.069	75.78	6.334	71.04	44.786	54.43	13.007	88.69
10.2	5.967	76.33	6.201	70.13	44.485	53.69	12.808	88.30
20.2	5.871	76.76	6.075	68.96	44.198	52.44	12.625	87.45
30.1	5.787	77.06	5.962	67.58	43.935	50.73	12.465	86.16
Feb. 9.1	5.721	77.21	5.866	66.06	43.709	48.62	12.330	84.46
19.1	5.674	77.18	5.796	64.46	43.531	46.21	12.230	82.40
Mar. 1.1	5.653	76.95	5.757	62.84	43.415	43.59	12.166	80.03
11.0	5.662	76.52	5.753	61.30	43.366	40.89	12.145	77.39
21.0	5.704	75.84	5.793	59.90	43.392	38.21	12.170	74.53
31.0	5.783	74.94	5.877	58.73	43.499	35.67	12.244	71.51
Apr. 10.0	5.901	73.79	6.007	57.33	43.685	33.36	12.369	68.40
19.9	6.059	72.41	6.184	57.27	43.947	31.40	12.546	65.25
29.9	6.255	70.82	6.405	57.08	44.280	29.84	12.773	62.13
May 9.9	6.485	69.05	6.666	57.27	44.675	28.74	13.047	59.12
19.8	6.747	67.12	6.961	57.86	45.121	28.15	13.364	56.26
29.8	7.033	65.09	7.282	58.83	45.607	28.09	13.716	53.64
June 8.8	7.338	63.00	7.621	60.16	46.117	28.57	14.094	51.29
18.8	7.654	60.91	7.970	61.81	46.640	29.56	14.492	49.31
28.7	7.972	58.86	8.319	63.74	47.160	31.03	14.896	47.71
July 8.7	8.283	56.91	8.660	65.91	47.666	32.96	15.296	46.56
18.7	8.581	55.12	8.985	68.25	48.143	35.28	15.684	45.87
28.7	8.859	53.52	9.285	70.71	48.582	37.95	16.046	45.65
Aug. 7.6	9.108	52.14	9.554	73.22	48.975	40.91	16.375	45.92
17.6	9.325	51.03	9.789	75.75	49.313	44.08	16.661	46.65
27.6	9.505	50.18	9.984	78.23	49.592	47.40	16.898	47.81
Sept. 6.5	9.648	49.62	10.138	80.62	49.809	50.81	17.080	49.36
16.5	9.751	49.32	10.251	82.87	49.962	54.23	17.206	51.22
26.5	9.816	49.27	10.323	84.94	50.050	57.60	17.274	53.34
Oct. 6.5	9.844	49.46	10.357	86.81	50.076	60.85	17.286	55.60
16.4	9.841	49.83	10.357	88.44	50.044	63.90	17.246	57.93
26.4	9.807	50.37	10.324	89.82	49.956	66.70	17.158	60.22
Nov. 5.4	9.750	51.02	10.264	90.91	49.816	69.18	17.029	62.37
15.4	9.672	51.77	10.182	91.71	49.631	71.28	16.866	64.31
25.3	9.581	52.54	10.080	92.22	49.406	72.94	16.681	65.93
Dec. 5.3	9.479	53.32	9.962	92.39	49.148	74.13	16.478	67.19
15.3	9.372	54.08	9.834	92.24	48.866	74.79	16.265	68.03
25.2	9.262	54.77	9.700	91.79	48.568	74.91	16.051	68.42
35.2	9.155	55.40	9.563	91.03	48.264	74.49	15.843	68.33
Mean Place	5.255	78.77	5.642	55.99	44.428	31.28	12.088	79.72
Sec δ , Tan δ	1.006	-0.108	1.140	+0.546	1.925	+1.645	1.445	-1.043
$D\alpha$, D_α	+0.06	+0.01	+0.06	-0.04	+0.06	-0.11	+0.06	+0.07
$D\delta$, D_δ	+0.4	0.0	+0.4	0.0	+0.4	0.0	+0.4	0.0

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	23 Andromedæ. Mag. 5.1			γ Pegasi. Mag. 2.9			σ Andromedæ. Mag. 4.5			ι Ceti. Mag. 3.8		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	° ' "	h	m	° ' "	h	m	° ' "	h	m	° ' "
	0	5	+45 36	0	8	+14 43	0	13	+36 19	0	15	- 9 16
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.2	60.691		57.54	58.387		30.29	59.976		47.92	12.861		60.13
10.2	60.496 ¹⁸⁶		56.69 ⁸⁸	58.276 ¹¹¹		29.48 ⁸¹	59.820 ¹⁵⁶		47.10 ⁸³	12.753 ¹⁰⁸		60.65 ⁵²
20.2	60.308 ¹⁸⁸		55.43 ¹²⁶	58.170 ¹⁰⁶		28.55 ⁹⁸	59.669 ¹⁵¹		45.94 ¹¹⁶	12.650 ¹⁰³		61.03 ³⁸
30.2	60.138 ¹⁷⁰		53.80 ¹⁶³	58.074 ⁹⁶		27.55 ¹⁰⁰	59.529 ¹⁴⁰		44.50 ¹⁴⁴	12.556 ⁹⁴		61.23 ²⁰
Feb. 9.1	59.991 ¹⁴⁷		51.89 ¹⁹¹	57.993 ⁸¹		26.53 ¹⁰²	59.409 ¹²⁰		42.83 ¹⁶⁷	12.477 ⁷⁹		61.26 ³
19.1	59.878 ¹¹³		49.75 ²¹⁴	57.934 ⁵⁹		25.52 ¹⁰¹	59.315 ⁹⁴		41.01 ¹⁸²	12.417 ⁶⁰		61.26 ¹⁸
Mar. 1.1	59.807 ⁷¹		47.49 ²³⁶	57.901 ³³		24.60 ⁹²	59.255 ⁶⁰		39.12 ¹⁸⁰	12.382 ³⁵		61.08 ³⁸
11.0	59.785 ²²		45.22 ²³⁷	57.899 ²		23.80 ⁸⁰	59.235 ²⁰		37.25 ¹⁸⁷	12.375 ⁷		60.70 ⁶²
21.0	59.817 ⁸²		43.02 ²³⁰	57.934 ⁸⁵		23.20 ⁶⁹	59.261 ²⁶		35.47 ¹⁷⁸	12.402 ²⁷		60.08 ⁸⁴
31.0	59.907 ⁹⁰		41.00 ²⁰²	58.009 ⁷⁸		22.82 ⁸⁸	59.336 ⁷⁵		33.89 ¹⁵⁸	12.466 ⁶⁴		58.15 ¹⁰⁹
Apr. 10.0	60.055 ¹⁴⁸		39.25 ¹⁷⁸	58.126 ¹¹⁷		22.72 ¹⁰	59.462 ¹²⁶		32.56 ¹³³	12.570 ¹⁰⁴		56.84 ¹³¹
19.9	60.262 ²⁰⁷		37.82 ¹⁴⁸	58.285 ¹⁵⁹		22.92 ²⁰	59.639 ¹⁷⁷		31.56 ¹⁰⁰	12.713 ¹⁴³		55.29 ¹⁵⁵
29.9	60.523 ²⁶¹		36.80 ¹⁰²	58.484 ¹⁹⁹		23.43 ⁵¹	59.865 ²³⁶		30.93 ⁶³	12.897 ¹⁸⁴		53.56 ¹⁷³
May 9.9	60.832 ³⁰⁹		36.22 ⁵⁸	58.719 ²³⁵		24.26 ⁸³	60.135 ²⁷⁰		30.71 ²²	13.118 ²²¹		51.65 ¹⁹¹
19.8	61.182 ³⁵⁰		36.11 ¹¹	58.988 ²⁶⁹		25.40 ¹¹⁴	60.443 ³⁰⁸		30.91 ²⁰	13.371 ²⁵⁸		49.62 ²⁰³
29.8	61.562 ³⁸⁰		36.48 ³⁷	59.284 ²⁰⁶		26.81 ¹⁴¹	60.782 ³³⁹		31.54 ⁶⁸	13.651 ²⁸⁸		47.50 ²¹²
June 8.8	61.965 ⁴⁰⁸		37.32 ⁸⁴	59.597 ³¹³		28.47 ¹⁶⁶	61.141 ³⁶⁰		32.58 ¹⁰⁴	13.953 ³⁰²		45.35 ²¹⁵
18.8	62.378 ⁴¹³		38.61 ¹²⁹	59.921 ³²⁴		30.34 ¹⁸⁷	61.511 ³⁷⁰		33.99 ¹⁴¹	14.267 ³¹⁴		43.23 ²¹²
28.7	62.791 ⁴¹³		40.32 ¹⁷¹	60.247 ³²⁶		32.36 ²⁰²	61.884 ³⁷³		35.76 ¹⁷⁷	14.586 ³¹⁹		41.17 ²⁰⁶
July 8.7	63.193 ⁴⁰²		42.38 ²⁰⁶	60.567 ³²⁰		34.49 ²¹³	62.250 ³⁶⁶		37.83 ²⁰⁷	14.901 ³¹⁵		39.25 ¹⁹²
18.7	63.575 ³⁸²		44.75 ²³⁷	60.873 ³⁰⁶		36.66 ²¹⁷	62.598 ³⁴⁸		40.13 ²³⁰	15.204 ³⁰³		37.50 ¹⁷⁵
28.7	63.927 ³⁵²		47.40 ²⁶⁵	61.158 ²⁸⁵		38.83 ²¹⁷	62.923 ³²⁵		42.63 ²⁵⁰	15.490 ²⁸⁶		35.98 ¹⁵²
Aug. 7.6	64.242 ³¹⁵		50.23 ²⁸³	61.414 ²⁶⁴		40.94 ²¹¹	63.216 ²⁹³		45.27 ²⁶⁴	15.749 ²⁵⁹		34.71 ¹²⁷
17.6	64.515 ²⁷³		53.19 ²⁹⁶	61.639 ²²⁵		42.96 ²⁰²	63.473 ²⁶⁷		47.98 ²⁷¹	15.978 ²²⁹		33.71 ¹⁰⁰
27.6	64.742 ²²⁷		56.24 ³⁰⁵	61.828 ¹⁸⁹		44.84 ¹⁸⁸	63.689 ²¹⁶		50.70 ²⁷²	16.171 ¹⁹³		33.02 ⁶⁹
Sept. 6.5	64.921 ¹⁷⁹		59.28 ³⁰⁴	61.979 ¹⁵¹		46.54 ¹⁷⁰	63.863 ¹⁷⁴		53.39 ²⁶⁹	16.326 ¹⁵⁵		32.82 ⁴⁰
16.5	65.050 ¹²⁹		62.28 ³⁰⁰	62.092 ¹¹³		48.05 ¹⁵¹	63.993 ¹³⁰		55.98 ²⁶⁹	16.443 ¹¹⁷		32.51 ¹¹
26.5	65.130 ⁸⁰		65.17 ²⁸⁹	62.166 ⁷⁴		49.35 ¹³⁰	64.080 ⁸⁷		58.44 ²⁴⁶	16.521 ⁷⁸		32.66 ¹⁵
Oct. 6.5	65.163 ³³		67.90 ²⁷³	62.206 ⁴⁰		50.42 ¹⁰⁷	64.127 ⁴⁷		60.72 ²²⁸	16.563 ⁴²		33.04 ³⁸
16.4	65.153 ¹⁰		70.41 ²⁵¹	62.213 ⁷		51.27 ⁸⁵	64.134 ⁷		62.78 ²⁰⁶	16.571 ⁸		33.62 ⁵⁸
26.4	65.103 ⁵⁰		72.65 ²²⁴	62.190 ²³		51.87 ⁶⁰	64.106 ²⁶		64.59 ¹⁸¹	16.548 ²³		34.36 ⁷⁴
Nov. 5.4	65.016 ⁸⁷		74.58 ¹⁹⁸	62.144 ⁴⁶		52.27 ⁴⁰	64.047 ⁵⁹		66.11 ¹⁸²	16.501 ⁴⁷		35.20 ⁶⁴
15.4	64.897 ¹¹⁹		76.16 ¹⁵⁸	62.075 ⁶⁶		52.43 ¹⁶	63.961 ⁸⁶		67.31 ¹²⁰	16.432 ⁶⁹		36.10 ⁹⁰
25.3	64.751 ¹⁴⁶		77.34 ¹¹⁸	61.990 ⁸⁰		52.40 ⁸	63.851 ¹¹⁰		68.16 ⁸⁵	16.346 ⁹⁶		37.02 ⁹²
Dec. 5.3	64.584 ¹⁶⁷		78.11 ⁷⁷	61.893 ⁹⁷		52.16 ²⁴	63.723 ¹²⁸		68.67 ⁵¹	16.248 ⁹⁸		37.91 ⁸⁹
15.3	64.401 ¹⁸³		78.42 ³¹	61.785 ¹⁰⁸		51.73 ⁴³	63.579 ¹⁴⁴		68.79 ¹²	16.141 ¹⁰⁷		38.74 ⁸³
25.2	64.206 ¹⁹⁶		78.27 ¹⁵	61.672 ¹¹³		51.13 ⁶⁰	63.426 ¹⁵³		68.53 ²⁶	16.030 ¹¹¹		39.48 ⁷⁴
35.2	64.007 ¹⁹⁹		77.68 ⁵⁹	61.557 ¹¹⁵		50.37 ⁷⁶	63.267 ¹⁵⁹		67.90 ⁶⁸	15.917 ¹¹³		40.10 ⁶²
Mean Place	60.119		37.45	57.598		19.85	59.251		30.33	11.958		62.18
Sec δ, Tan δ	1.430		+1.022	1.034		+0.263	1.241		+0.735	1.013		-0.163
D _φ α, D _ω α	+0.06		-0.07	+0.06		-0.02	+0.06		-0.05	+0.06		+0.01
D _φ δ, D _ω δ	+0.4		0.0	+0.4		0.0	+0.4		+0.1	+0.4		+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Tucanæ. Mag. 4.3		44 Piscium. Mag. 6.0		β Hydr. Mag. 2.9		α Phœnicks. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 15	° ' " -65 21	h m 0 21	° ' " + 1 28	h m 0 21	° ' " -77 42	h m 0 22	° ' " -42 44
	s	"	s	"	s	"	s	"
Jan. 0.2	46.52	56.29	9.746	54.08	25.85	91.51	12.136	92.28
10.2	46.12	55.45	9.640	53.41	24.94	90.45	11.948	92.16
20.2	45.74	54.05	9.537	52.77	24.08	88.79	11.769	91.58
30.2	45.40	52.14	9.443	52.19	23.30	86.60	11.608	90.57
Feb. 9.1	45.10	49.76	9.361	51.70	22.64	83.93	11.467	89.16
19.1	44.88	46.98	9.298	51.34	22.08	80.86	11.355	87.37
Mar. 1.1	44.71	43.86	9.257	51.14	21.66	77.47	11.276	85.24
11.0	44.61	40.49	9.247	51.12	21.38	73.84	11.235	82.82
21.0	44.58	36.92	9.270	51.31	21.25	70.05	11.237	80.14
31.0	44.64	33.25	9.330	51.73	21.28	66.20	11.285	77.29
Apr. 10.0	44.78	29.55	9.429	52.42	21.47	62.35	11.384	74.30
19.9	45.01	25.88	9.568	53.34	21.80	58.59	11.532	71.22
29.9	45.30	22.35	9.749	54.53	22.28	55.01	11.730	68.14
May 9.9	45.68	19.01	9.967	55.95	22.91	51.67	11.975	65.12
19.9	46.12	15.95	10.218	57.58	23.67	48.66	12.263	62.20
29.8	46.62	13.22	10.496	59.38	24.53	46.03	12.586	59.48
June 8.8	47.17	10.88	10.795	61.31	25.49	43.85	12.940	57.01
18.8	47.75	9.02	11.107	63.33	26.51	42.16	13.314	54.85
28.7	48.34	7.65	11.424	65.38	27.57	41.01	13.698	53.05
July 8.7	48.94	6.81	11.738	67.41	28.65	40.42	14.083	51.66
18.7	49.53	6.52	12.041	69.37	29.70	40.42	14.458	50.72
28.7	50.09	6.78	12.327	71.20	30.71	40.98	14.812	50.25
Aug. 7.6	50.59	7.59	12.586	72.87	31.64	42.10	15.139	50.27
17.6	51.04	8.92	12.817	74.34	32.46	43.74	15.427	50.73
27.6	51.42	10.71	13.013	75.57	33.14	45.84	15.672	51.66
Sept. 6.6	51.71	12.90	13.173	76.57	33.67	48.34	15.867	52.99
16.5	51.90	15.41	13.295	77.32	34.03	51.12	16.010	54.67
26.5	52.00	18.14	13.380	77.81	34.19	54.11	16.099	56.63
Oct. 6.5	52.01	20.98	13.431	78.06	34.18	57.19	16.137	58.80
16.4	51.92	23.83	13.448	78.11	33.96	60.22	16.124	61.06
26.4	51.75	26.57	13.436	77.97	33.58	63.10	16.066	63.33
Nov. 5.4	51.49	29.06	13.399	77.65	33.04	65.70	15.969	65.53
15.4	51.18	31.22	13.341	77.21	32.34	67.91	15.837	67.54
25.3	50.82	32.97	13.264	76.66	31.55	69.65	15.679	69.30
Dec. 5.3	50.42	34.23	13.174	76.04	30.67	70.84	15.502	70.73
15.3	49.99	34.94	13.074	75.36	29.73	71.43	15.312	71.77
25.3	49.56	35.07	12.968	74.65	28.78	71.39	15.116	72.40
35.2	49.14	34.60	12.859	73.94	27.84	70.73	14.921	72.58
Mean Place	45.483	43.94	8.836	48.19	24.623	78.09	11.117	84.20
Sec δ , Tan δ	2.398	-2.180	1.000	+0.026	4.701	-4.593	1.362	-0.924
$D\phi\alpha$, $D_\alpha\alpha$	+0.06	+0.15	+0.06	0.00	+0.05	+0.31	+0.06	+0.06
$D\phi\delta$, $D_\delta\delta$	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	13 Ceti. Mag. 6.0		13 Ceti. Mag. 5.2		Cassiopeia. Mag. 3.7		π Andromedæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 25	° ' " - 4 24	h m 0 30	° ' " - 4 2	h m 0 32	° ' " +53 26	h m 0 32	° ' " +33 15
	s	"	s	"	s	"	s	"
Jan. 0.2	49.149	52.80	59.497	54.33	21.192	47.51	27.519	62.36
10.2	49.041 ¹⁰⁸	53.42 ⁶²	59.389 ¹⁰⁸	54.95 ⁶²	20.942 ²⁶⁰	47.02 ⁴⁹	27.371 ¹⁴⁸	61.66 ⁷⁰
20.2	48.936 ¹⁰⁵	53.93 ⁵¹	59.283 ¹⁰⁶	55.48 ⁵³	20.693 ²⁴⁹	46.05 ⁹⁷	27.224 ¹⁴⁷	60.67 ⁹⁹
30.2	48.838 ⁹⁶	54.32 ³⁹	59.184 ⁹⁹	55.89 ⁴¹	20.456 ²³⁷	44.64 ¹⁴¹	27.083 ¹⁴¹	59.40 ¹²⁷
Feb. 9.1	48.752 ⁸⁶	54.56 ²⁴	59.096 ⁸⁸	56.14 ²⁵	20.244 ²¹²	42.84 ¹⁸⁰	26.958 ¹²⁵	57.93 ¹⁴⁷
	67	8	70	10	177	211	104	163
19.1	48.685	54.64	59.026	56.24	20.067	40.73	26.854	56.30
Mar. 1.1	48.640	54.53	58.977	56.15	19.935	38.40	26.781	54.60
11.1	48.624 ¹⁶	54.21 ³²	58.958 ¹⁹	55.85 ³⁰	19.858 ⁷⁷	35.96 ²⁴⁴	26.744 ³⁷	52.91 ¹⁶⁹
21.0	48.642 ¹⁸	53.67 ⁵⁴	58.971 ¹³	55.33 ⁵²	19.845 ¹³	33.50 ²⁴⁶	26.749 ⁵	51.31 ¹⁶⁰
31.0	48.696 ⁵⁴	52.88 ⁷⁹	59.020 ⁴⁹	54.56 ⁷⁷	19.901 ⁵⁶	31.13 ²⁸⁷	26.803 ⁵⁴	49.87 ¹⁴⁴
	93	102	89	99	125	217	103	120
Apr. 10.0	48.789	51.86	59.109	53.57	20.026	28.96	26.906	48.67
19.9	48.924 ¹³⁵	50.59 ¹²⁷	59.239 ¹³⁰	52.33 ¹²⁴	20.222 ¹⁹⁶	27.06 ¹⁹⁰	27.059 ¹⁵³	47.75 ⁹²
29.9	49.098 ¹⁷⁴	49.10 ¹⁴⁹	59.410 ¹⁷¹	50.87 ¹⁴⁶	20.485 ²⁶⁸	25.52 ¹⁵⁴	27.262 ²⁰³	47.19 ⁵⁶
May 9.9	49.311 ²¹³	47.41 ¹⁸⁹	59.619 ²⁰⁹	49.20 ¹⁶⁷	20.807 ³²²	24.41 ¹¹¹	27.510 ²⁴⁸	47.01 ¹⁸
19.9	49.558 ²⁴⁷	45.56 ¹⁸⁵	59.862 ²⁴³	47.37 ¹⁸³	21.183 ³⁷⁶	23.75 ⁶⁶	27.796 ²⁸⁶	47.21 ²⁰
	273	199	273	197	418	17	320	60
29.8	49.831	43.57	60.134	45.40	21.601	23.58	28.116	47.81
June 8.8	50.128 ²⁹⁷	41.51 ²⁰⁶	60.428 ²⁹⁴	43.35 ²⁰⁸	22.048 ⁴⁴⁷	23.89 ³¹	28.460 ³⁴⁴	48.79 ⁹⁶
18.8	50.439 ³¹⁷	39.42 ²⁰⁹	60.739 ³¹¹	41.27 ²⁰⁸	22.514 ⁴⁶⁶	24.69 ⁸⁰	28.819 ³⁵⁹	50.13 ¹³⁴
28.8	50.756 ³¹¹	37.36 ²⁰⁶	61.055 ³¹⁶	39.20 ²⁰⁷	22.986 ⁴⁷²	25.96 ¹²⁷	29.183 ³⁶⁴	51.80 ¹⁶⁷
July 8.7	51.071 ³¹⁵	35.37 ¹⁹⁹	61.371 ³¹⁸	37.21 ¹⁹⁹	23.452 ⁴⁶⁶	27.65 ¹⁶⁹	29.544 ³⁶¹	53.74 ¹⁹⁴
	304	186	306	187	449	208	348	217
18.7	51.375	33.51	61.677	35.34	23.901	29.73	29.892	55.91
28.7	51.663 ²⁸⁸	31.83 ¹⁶⁸	61.968 ²⁹¹	33.65 ¹⁶⁹	24.323 ⁴²²	32.13 ²⁴⁰	30.220 ³²⁸	58.26 ²³⁵
Aug. 7.6	51.926 ²⁶³	30.36 ¹⁴⁷	62.234 ²⁶⁶	32.17 ¹⁴⁸	24.709 ³⁹⁶	34.82 ²⁶⁹	30.521 ³⁰¹	60.72 ²⁴⁶
17.6	52.161 ²³⁵	29.14 ¹²³	62.473 ²³⁹	30.93 ¹²⁴	25.052 ³⁴³	37.73 ²⁹¹	30.788 ²⁶⁷	63.24 ²⁵²
27.6	52.361 ²⁰⁰	28.18 ⁹⁶	62.678 ²⁰⁶	29.95 ⁹⁸	25.347 ²⁹⁵	40.80 ³⁰⁷	31.020 ²³²	65.78 ²⁵⁴
	164	67	170	70	242	315	191	250
Sept. 6.6	52.525	27.51	62.848	29.25	25.589	43.95	31.211	68.28
16.5	52.651 ¹²⁶	27.10 ⁴¹	62.980 ¹³²	28.82 ⁴³	25.776 ¹⁸⁷	47.13 ³¹⁸	31.361 ¹⁵⁰	70.69 ²⁴¹
26.5	52.741 ⁹⁰	26.97 ¹³	63.075 ⁹⁵	28.67 ¹⁵	25.910 ¹²⁴	50.23 ³¹⁵	31.470 ¹⁰⁹	72.98 ²²⁹
Oct. 6.5	52.794 ⁵³	27.06 ⁹	63.135 ⁶⁰	28.75 ⁸	25.989 ⁷⁹	53.32 ³⁰⁴	31.540 ³⁰	75.08 ²¹⁰
16.5	52.814 ⁹	27.38 ³²	63.161 ²⁶	29.05 ³⁰	26.016 ²⁷	56.22 ²⁹⁰	31.572 ³²	77.00 ¹⁹²
		49	3	47	22	268	1	167
26.4	52.805	27.87	63.158	29.52	25.994	58.90	31.571	78.67
Nov. 5.4	52.769 ³⁶	28.49 ⁶²	63.127 ³¹	30.13 ⁶¹	25.924 ⁷⁰	61.31 ²⁴¹	31.537 ³⁴	80.10 ¹⁴³
15.4	52.712 ⁵⁷	29.21 ⁷²	63.074 ⁵³	30.86 ⁷³	25.811 ¹¹³	63.39 ²⁰⁸	31.475 ⁶²	81.23 ¹¹³
25.3	52.636 ⁷⁶	29.98 ⁷⁷	63.002 ⁷²	31.63 ⁷⁷	25.659 ¹⁵²	65.08 ¹⁶⁹	31.388 ⁸⁷	82.05 ⁸²
Dec. 5.3	52.546 ⁹⁰	30.78 ⁸⁰	62.916 ⁸⁶	32.43 ⁸⁰	25.475 ¹⁸⁴	66.35 ¹²⁷	31.281 ¹⁰⁷	82.55 ⁵⁰
	100	79	98	79	215	80	126	16
15.3	52.446	31.57	62.818	33.22	25.260	67.15	31.155	82.71
25.3	52.338 ¹⁰⁸	32.32 ⁷⁵	62.712 ¹⁰⁶	33.98 ⁷⁶	25.025 ²³⁵	67.45 ³⁰	31.015 ¹⁴⁰	82.53 ¹⁸
35.2	52.227 ¹¹¹	32.99 ⁶⁷	62.602 ¹¹⁰	34.67 ⁶⁹	24.776 ²⁴⁹	67.26	30.868 ¹⁴⁷	82.02 ⁵¹
Mean Place	48.196	56.65	58.516	58.34	20.390	25.07	26.620	45.46
Sec δ, Tan δ	1.003	-0.077	1.002	-0.071	1.679	+1.349	1.196	+0.656
D _φ α, D _α α	+0.06	+0.01	+0.06	0.00	+0.07	-0.09	+0.06	-0.04
D _φ δ, D _δ δ	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1	+0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Andromedæ. Mag. 4.5		δ Andromedæ. Mag. 3.5		α Cassiopeiæ. (Schedir.) Var. 2.2-2.8		μ Phœnicis. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 34	° ' " +28 51	h m 0 34	° ' " +30 24	h m 0 35	° ' " +56 4	h m 0 37	° ' " -46 31
	s	"	s	"	s	"	s	"
Jan. 0.2	10.879	56.04	54.075	40.59	48.101	79.47	25.410	96.09
10.2	10.742	55.33	53.936	39.88	47.827	79.06	25.194	96.00
20.2	10.605	54.36	53.795	38.92	47.554	78.15	24.968	95.44
30.2	10.475	53.16	53.661	37.70	47.293	76.78	24.792	94.42
Feb. 9.1	10.358	51.80	53.542	36.31	47.056	74.99	24.620	92.95
19.1	10.261	50.33	53.442	34.79	46.857	72.86	24.474	91.09
Mar. 1.1	10.193	48.81	53.371	33.22	46.707	70.50	24.363	88.86
11.1	10.158	47.32	53.334	31.66	46.617	68.00	24.292	86.31
21.0	10.163	45.93	53.339	30.20	46.594	65.46	24.265	83.51
31.0	10.213	44.73	53.390	28.90	46.644	62.99	24.288	80.49
Apr. 10.0	10.311	43.75	53.488	27.85	46.768	60.69	24.362	77.34
19.9	10.457	43.07	53.636	27.09	46.969	58.68	24.490	74.11
29.9	10.649	42.73	53.832	26.66	47.240	57.01	24.672	70.87
May 9.9	10.884	42.73	54.071	26.60	47.576	55.76	24.906	67.69
19.9	11.160	43.12	54.349	26.92	47.968	54.96	25.187	64.64
29.8	11.467	43.88	54.660	27.60	48.405	54.65	25.509	61.77
June 8.8	11.796	44.99	54.995	28.66	48.975	54.84	25.865	59.18
18.8	12.141	46.41	55.346	30.05	49.365	55.53	26.246	56.91
28.8	12.494	48.13	55.702	31.74	49.863	56.69	26.643	55.01
July 8.7	12.842	50.09	56.055	33.68	50.354	58.30	27.044	53.66
18.7	13.180	52.24	56.397	35.84	50.830	60.31	27.437	52.57
28.7	13.499	54.53	56.720	38.13	51.277	62.67	27.816	52.07
Aug. 7.6	13.790	56.89	57.016	40.53	51.687	65.34	28.166	52.08
17.6	14.050	59.29	57.280	42.97	52.053	68.24	28.480	52.59
27.6	14.275	61.66	57.510	45.40	52.368	71.33	28.751	53.57
Sept. 6.6	14.462	63.97	57.700	47.77	52.628	74.52	28.973	54.97
16.5	14.609	66.16	57.850	50.04	52.832	77.77	29.141	56.76
26.5	14.717	68.20	57.961	52.16	52.978	81.00	29.252	58.86
Oct. 6.5	14.787	70.07	58.033	54.12	53.066	84.15	29.307	61.17
16.5	14.821	71.72	58.068	55.87	53.098	87.15	29.307	63.61
26.4	14.822	73.16	58.071	57.39	53.076	89.95	29.257	66.07
Nov. 5.4	14.793	74.33	58.042	58.66	53.004	92.48	29.163	68.46
15.4	14.737	75.24	57.987	59.66	52.885	94.69	29.029	70.66
25.3	14.657	75.86	57.907	60.36	52.722	96.52	28.863	72.60
Dec. 5.3	14.558	76.19	57.807	60.77	52.522	97.91	28.673	74.20
15.3	14.442	76.23	57.688	60.85	52.291	98.83	28.464	75.38
25.3	14.314	75.94	57.557	60.61	52.034	99.24	28.246	76.11
35.2	14.178	75.39	57.418	60.09	51.763	99.14	28.025	76.37
Mean Place	9.953	40.54	53.148	24.57	47.272	56.41	24.283	87.18
Sec δ , Tan δ	1.142	+0.551	1.160	+0.587	1.792	+1.487	1.453	-1.055
$D_{\phi} \alpha$, $D_{\alpha} \alpha$	+0.06	-0.04	+0.06	-0.04	+0.07	-0.10	+0.06	+0.07
$D_{\phi} \delta$, $D_{\alpha} \delta$	+0.4	+0.1	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ceti. Mag. 2.2		\circ Cassiopeia. Mag. 4.7		δ Cassiopeia. Mag. 5.6		ζ Andromeda. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 39	° ' " -18 25	h m 0 40	° ' " +47 49	h m 0 40	° ' " +74 32	h m 0 42	° ' " +23 48
	s	"	s	"	s	"	s	"
Jan. 0.3	26.503	91.72	6.539	70.41	9.22	30.88	57.151	71.04
10.2	26.380 ¹²³	92.20 ⁴⁸	6.330 ²⁰⁹	69.93 ⁴⁸	8.53 ⁶⁹	30.87 ¹	57.024 ¹²⁷	70.35 ⁶⁹
20.2	26.259 ¹²¹	92.42 ²³	6.119 ²¹¹	69.00 ⁹⁸	7.84 ⁶⁹	30.26 ⁶¹	56.896 ¹²⁸	69.47 ⁸⁸
30.2	26.145 ¹¹⁴	92.38 ⁴	5.916 ²⁰⁸	67.68 ¹³²	7.18 ⁶⁶	29.06 ¹²⁰	56.772 ¹²⁴	68.42 ¹⁰⁶
Feb. 9.1	26.042 ¹⁰³	92.07 ³¹	5.731 ¹⁸⁵	66.01 ¹⁶⁷	6.58 ⁶⁰	27.33 ¹⁷³	56.659 ¹¹³	67.22 ¹²⁰
	96	58	156	194	52	220	96	126
19.1	25.956 ⁶³	91.49 ⁸⁴	5.575 ¹¹⁷	64.07 ²¹⁵	6.06 ³⁹	25.13 ²⁵⁷	56.563 ⁷¹	65.97 ¹²⁷
Mar. 1.1	25.893 ³⁴	90.65 ¹¹²	5.458 ⁷¹	61.92 ²²³	5.67 ²⁸	22.56 ²⁸²	56.492 ³	64.70 ¹²²
11.1	25.859 ²	89.53 ¹³⁶	5.387 ¹⁶	59.69 ²²⁴	5.39 ¹³	19.74 ²⁹⁶	56.453 ⁸	63.48 ¹¹⁰
21.0	25.857 ³⁶	88.17 ¹⁶¹	5.371 ⁴⁴	57.45 ²¹⁴	5.26 ⁴	16.79 ²⁹⁷	56.450 ⁴¹	62.38 ⁹³
31.0	25.893 ⁷⁷	86.56 ¹⁸³	5.415 ¹⁰⁷	55.31 ¹⁹⁶	5.30 ¹⁸	13.82 ²⁸⁸	56.491 ⁸⁶	61.45 ⁶⁹
Apr. 10.0	25.970 ¹¹⁹	84.73 ²⁰¹	5.522 ¹⁶⁹	53.36 ¹⁶⁷	5.48 ³⁴	10.94 ²⁶⁵	56.577 ¹³²	60.76 ⁴²
20.0	26.089 ¹⁶²	82.72 ²¹⁹	5.691 ²³⁰	51.69 ¹³²	5.82 ⁴⁹	8.29 ²³⁵	56.709 ¹⁷⁹	60.34 ¹⁰
29.9	26.251 ²⁰²	80.53 ²³⁰	5.921 ²⁸⁷	50.37 ⁹⁶	6.31 ⁶⁰	5.94 ¹⁹⁶	56.888 ²²¹	60.24 ²⁴
May 9.9	26.453 ²³⁸	78.23 ²³⁸	6.208 ³³⁵	49.42 ⁴⁹	6.91 ⁷²	3.99 ¹⁴⁸	57.109 ²⁶⁰	60.48 ⁵⁷
19.9	26.691 ²⁷¹	75.85 ²³⁹	6.543 ³⁷⁴	48.93 ⁴	7.63 ⁸¹	2.51 ⁹⁷	57.369 ²⁹¹	61.05 ⁹⁰
29.8	26.962 ²⁹⁶	73.46 ²³⁵	6.917 ⁴⁰⁴	48.89 ⁴²	8.44 ⁸⁷	1.54 ⁴³	57.660 ³¹⁶	61.95 ¹²³
June 8.8	27.258 ³¹³	71.11 ²²⁶	7.321 ⁴²³	49.31 ⁸⁸	9.31 ⁹¹	1.11 ¹¹	57.976 ³³³	63.18 ¹⁵⁰
18.8	27.571 ³²³	68.35 ²⁰⁹	7.744 ⁴³¹	50.19 ¹³⁰	10.22 ⁹⁸	1.22 ⁶⁷	58.309 ³⁴⁰	64.68 ¹⁷⁵
28.8	27.894 ³²⁴	66.76 ¹⁹⁰	8.175 ⁴²⁷	51.49 ¹⁶⁹	11.15 ⁹²	1.89 ¹¹⁹	58.649 ³³⁹	66.43 ¹⁹³
July 8.7	28.218 ³¹⁸	64.86 ¹⁶³	8.602 ⁴¹⁴	53.18 ²⁰⁵	12.07 ⁸⁹	3.06 ¹⁶⁹	58.988 ³³⁰	68.36 ²¹⁰
18.7	28.536 ³⁰²	63.23 ¹³⁴	9.016 ³⁹¹	55.23 ²³³	12.96 ⁸⁴	4.77 ²¹⁵	59.318 ³¹²	70.46 ²¹⁸
28.7	28.838 ²⁸⁰	61.89 ¹⁰⁰	9.407 ³⁶⁰	57.56 ²⁵⁹	13.80 ⁷⁷	6.92 ²⁵⁶	59.630 ²⁹⁰	72.64 ²²³
Aug. 7.7	29.118 ²⁵²	60.89 ⁶⁵	9.767 ³²³	60.15 ²⁷⁷	14.57 ⁶⁹	9.48 ²⁹¹	59.920 ²⁶⁶	74.87 ²²¹
17.6	29.370 ²¹⁸	60.24 ³⁰	10.089 ²⁸⁰	62.92 ²⁸⁰	15.26 ⁶⁰	12.39 ³³⁰	60.180 ²²⁰	77.08 ²¹⁶
27.6	29.588 ¹⁸¹	59.94 ⁵	10.369 ²³³	65.81 ²⁹⁶	15.86 ⁴⁸	15.59 ³⁴²	60.406 ¹⁹¹	79.24 ²⁰⁶
Sept. 6.6	29.769 ¹⁴³	59.99 ³⁹	10.602 ¹⁸⁵	68.77 ²⁹⁷	16.34 ³⁸	19.01 ³⁵⁹	60.597 ¹⁵³	81.30 ¹⁹³
16.5	29.912 ¹⁰³	60.38 ⁶⁹	10.787 ¹³⁷	71.74 ²⁹²	16.72 ²⁷	22.60 ³⁶⁶	60.750 ¹¹⁵	83.23 ¹⁷⁷
26.5	30.015 ⁶⁵	61.07 ⁹⁸	10.924 ⁸⁹	74.66 ²⁸¹	16.99 ¹⁴	26.26 ³⁶⁷	60.865 ⁷⁸	85.00 ¹⁶⁷
Oct. 6.5	30.080 ²⁸	62.00 ¹¹⁴	11.013 ⁴²	77.47 ²⁶⁵	17.13 ²	29.93 ³⁶¹	60.943 ⁴⁵	86.57 ¹³⁸
16.5	30.106 ⁵	63.14 ¹²⁸	11.055 ²	80.12 ²⁴⁴	17.15 ⁹	33.54 ³⁴⁴	60.988 ¹²	87.95 ¹¹⁵
26.4	30.103 ²⁴	64.42 ¹²⁶	11.053 ⁴³	82.56 ²¹⁷	17.06 ²¹	36.98 ³²³	61.000 ¹⁷	89.10 ⁹²
Nov. 5.4	30.069 ⁵⁹	65.77 ¹³⁶	11.010 ⁸²	84.73 ¹⁸⁸	16.85 ³¹	40.21 ²⁹²	60.983 ⁴²	90.02 ⁶⁷
15.4	30.010 ⁸²	67.13 ¹³¹	10.928 ¹¹⁷	86.61 ¹⁵¹	16.54 ⁴³	43.13 ²⁵³	60.941 ⁶⁷	90.69 ⁴³
25.4	29.928 ⁹⁸	68.44 ¹¹⁹	10.811 ¹⁴⁶	88.12 ¹¹¹	16.11 ⁵¹	45.66 ¹⁵⁵	60.874 ¹⁰³	91.12 ¹⁷
Dec. 5.3	29.830 ¹¹⁰	69.63 ¹⁰⁶	10.665 ¹⁷⁴	89.23 ⁶⁹	15.60 ⁵⁹	47.72 ¹⁵⁵	60.788 ¹²⁶	91.29 ⁷
15.3	29.720 ¹²¹	70.69 ⁸⁷	10.491 ¹⁹³	89.92 ²⁴	15.01 ⁶⁵	49.27 ⁹⁶	60.685 ¹¹⁸	91.22 ³³
25.3	29.599 ¹²⁵	71.56 ⁶³	10.298 ²⁰⁸	90.16 ²⁰	14.36 ⁶⁸	50.23 ³⁷	60.567 ¹²⁶	90.89 ⁵⁶
35.2	29.474	72.19	10.090	89.96	13.68	50.60	60.441	90.33
Mean Place	25.444	90.85	5.617	49.29	8.510	4.64	56.147	57.14
Sec δ , Tan δ	1.054	-0.333	1.490	+1.104	3.750	+3.615	1.093	+0.441
$D\alpha$, $D_\alpha \alpha$	+0.06	+0.02	+0.07	-0.07	+0.08	-0.24	+0.06	-0.03
$D\delta$, $D_\delta \delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cassiopeæ. Mag. 3.6		δ Piscium. Mag. 4.6		λ Hydri. Mag. 5.0		ϵ Ceti. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 44	° ' " +57 22	h m 0 44	° ' " + 7 8	h m 0 45	° ' " -75 21	h m 0 48	° ' " -1 35
	s	"	s	"	s	"	s	"
Jan. 0.3	5.127	58.92	23.511	9.06	44.83	102.71	46.956	35.46
10.2	4.845 282	58.62 30	23.401 110	8.37 69	44.03 80	102.06 65	46.846 110	36.12 66
20.2	4.561 284	57.80 82	23.291 110	7.65 72	43.27 76	100.81 125	46.735 111	36.71 59
30.2	4.286 275	56.51 129	23.183 108	6.95 70	42.55 72	99.00 181	46.627 108	37.20 49
Feb. 9.1	4.036 250	54.80 171	23.086 97	6.27 68	41.90 65	96.68 232	46.527 100	37.56 36
	212	208	84	60	55	278	85	21
19.1	3.824 165	52.72 234	23.002 60	5.67 48	41.35 46	93.90 314	46.442 63	37.77 5
Mar. 1.1	3.659 106	50.38 251	22.942 33	5.19 35	40.89 34	90.76 346	46.379 37	37.82 15
11.1	3.553 36	47.87 257	22.909 1	4.84 15	40.55 23	87.30 365	46.342 6	37.67 36
21.0	3.517 39	45.30 252	22.908 37	4.69 6	40.32 8	83.65 377	46.336 31	37.31 60
31.0	3.556 117	42.78 237	22.945 79	4.75 31	40.24 4	79.88 333	46.367 71	36.71 88
Apr. 10.0	3.673 195	40.41 212	23.024 120	5.06 57	40.28 18	76.05 380	46.438 113	35.88 106
20.0	3.868 269	38.29 178	23.144 164	5.63 83	40.46 30	72.25 368	46.551 155	34.80 131
29.9	4.137 339	36.51 139	23.308 202	6.46 110	40.76 45	68.57 348	46.706 194	33.49 152
May 9.9	4.476 397	35.12 94	23.510 238	7.56 133	41.21 55	65.09 333	46.900 230	31.97 172
19.9	4.873 447	34.18 45	23.748 270	8.89 157	41.76 66	61.86 288	47.130 262	30.25 189
29.8	5.320 482	33.73 4	24.018 294	10.46 174	42.42 75	58.93 247	47.392 286	28.36 197
June 8.8	5.802 506	33.77 54	24.312 310	12.20 187	43.17 81	56.51 200	47.678 305	26.39 203
18.8	6.308 515	34.31 102	24.622 318	14.07 197	43.98 88	54.51 150	47.983 314	24.36 205
28.8	6.823 513	35.33 147	24.940 320	16.04 202	44.86 90	53.01 94	48.297 316	22.31 200
July 8.7	7.336 497	36.80 188	25.260 311	18.06 199	45.76 89	52.07 36	48.613 306	20.31 191
18.7	7.833 472	38.68 226	25.571 296	20.05 194	46.65 87	51.71 21	48.921 296	18.40 176
28.7	8.305 435	40.94 258	25.867 274	21.99 183	47.52 81	51.92 79	49.217 276	16.64 157
Aug. 7.7	8.740 392	43.52 282	26.141 248	23.82 166	48.33 74	52.71 135	49.493 248	15.07 135
17.6	9.132 341	46.34 304	26.389 215	25.48 148	49.07 63	54.06 185	49.741 217	13.72 109
27.6	9.473 287	49.38 316	26.604 182	26.96 127	49.70 52	55.91 229	49.958 185	12.63 84
Sept. 6.6	9.760 228	52.54 322	26.786 145	28.23 106	50.22 37	58.20 266	50.143 148	11.79 56
16.5	9.988 169	55.76 323	26.931 111	29.28 82	50.59 22	60.86 291	50.291 112	11.23 29
26.5	10.157 110	58.99 319	27.042 74	30.10 58	50.81 7	63.77 308	50.403 77	10.94 6
Oct. 6.5	10.267 52	62.18 304	27.116 43	30.68 37	50.88 10	66.85 310	50.480 45	10.88 18
16.5	10.319 5	65.22 286	27.159 12	31.05 15	50.78 24	69.95 302	50.525 13	11.06 36
26.4	10.314 58	68.08 260	27.171 15	31.20 2	50.54 39	72.97 280	50.538 14	11.42 52
Nov. 5.4	10.256 109	70.68 230	27.156 38	31.18 20	50.15 51	75.77 250	50.524 38	11.94 63
15.4	10.147 154	72.98 192	27.118 59	30.98 33	49.64 63	78.27 206	50.486 59	12.57 72
25.4	9.993 196	74.90 150	27.059 78	30.65 45	49.01 71	80.33 156	50.427 91	13.29 76
Dec. 5.3	9.797 231	76.40 104	26.981 90	30.20 56	48.30 77	81.89 98	50.350 77	14.05 78
15.3	9.566 260	77.44 52	26.891 102	29.64 62	47.53 80	82.87 38	50.259 102	14.83 76
25.3	9.306 278	77.96 0	26.789 110	29.02 71	46.73 81	83.25 23	50.157 109	15.59 71
35.2	9.028	77.96	26.679	28.31	45.92	83.02	50.048	16.30
Mean Place	4.191	35.55	22.471	0.98	43.258	89.58	45.876	40.46
Sec δ , Tan δ	1.855	+1.563	1.008	+0.125	3.959	-3.831	1.000	-0.028
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.07	-0.10	+0.06	-0.01	+0.04	+0.26	+0.06	0.00
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cassiopeiae. Mag. 2.2		μ Andromedae. Mag. 3.9		α Sculptoris. Mag. 4.4		ϵ Piscium. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 51	° ' " +60 16	h m 0 52	° ' " +38 2	h m 0 54	° ' " -29 47	h m 0 58	° ' " + 7 26
Jan. 0.3	42.29	27.24	9.522	76.25	37.542	86.03	39.160	45.01
10.2	41.97	27.10	9.360	75.75	37.392	86.43	39.049	44.34
20.2	41.64	26.42	9.193	74.91	37.243	86.48	38.934	43.64
30.2	41.33	25.23	9.030	73.75	37.098	86.16	38.821	42.95
Feb. 9.2	41.03	23.59	8.878	72.33	36.965	85.48	38.714	42.29
19.1	40.78	21.56	8.747	70.69	36.850	84.45	38.620	41.70
Mar. 1.1	40.58	19.24	8.645	68.92	36.758	83.09	38.548	41.20
11.1	40.44	16.70	8.581	67.09	36.695	81.41	38.500	40.85
21.0	40.38	14.08	8.561	65.29	36.668	79.46	38.486	40.69
31.0	40.40	11.49	8.591	63.62	36.681	77.25	38.509	40.72
Apr. 10.0	40.50	9.01	8.675	62.12	36.737	74.84	38.573	41.00
20.0	40.69	6.77	8.814	60.90	36.838	72.26	38.680	41.52
29.9	40.96	4.83	9.006	59.99	36.984	69.57	38.830	42.31
May 9.9	41.30	3.28	9.247	59.45	37.175	66.81	39.020	43.35
19.9	41.71	2.17	9.534	59.30	37.407	64.04	39.249	44.65
29.9	42.18	1.54	9.857	59.55	37.677	61.34	39.511	46.15
June 8.8	42.69	1.41	10.209	60.21	37.976	58.76	39.798	47.85
18.8	43.22	1.78	10.580	61.25	38.297	56.37	40.104	49.68
28.8	43.77	2.65	10.962	62.64	38.633	54.22	40.420	51.61
July 8.7	44.32	3.98	11.343	64.36	38.974	52.37	40.739	53.58
18.7	44.85	5.76	11.715	66.36	39.311	50.87	41.054	55.55
28.7	45.36	7.92	12.069	68.58	39.636	49.77	41.354	57.46
Aug. 7.7	45.83	10.43	12.399	70.97	39.940	49.08	41.635	59.27
17.6	46.26	13.21	12.697	73.48	40.218	48.83	41.891	60.92
27.6	46.63	16.23	12.959	76.07	40.461	49.00	42.118	62.41
Sept. 6.6	46.95	19.41	13.181	78.66	40.666	49.58	42.311	63.69
16.6	47.20	22.68	13.363	81.20	40.830	50.53	42.470	64.73
26.5	47.40	25.98	13.504	83.66	40.951	51.83	42.594	65.55
Oct. 6.5	47.53	29.25	13.603	86.00	41.029	53.39	42.684	66.14
16.5	47.59	32.43	13.662	88.17	41.066	55.15	42.741	66.51
26.4	47.60	35.43	13.683	90.13	41.066	57.02	42.767	66.67
Nov. 5.4	47.54	38.21	13.669	91.84	41.030	58.94	42.766	66.65
15.4	47.43	40.67	13.624	93.29	40.964	60.80	42.740	66.47
25.4	47.27	42.78	13.547	94.42	40.872	62.54	42.692	66.15
Dec. 5.3	47.05	44.47	13.445	95.22	40.758	64.08	42.623	65.71
15.3	46.80	45.68	13.318	95.67	40.627	65.37	42.538	65.17
25.3	46.51	46.39	13.174	95.75	40.484	66.36	42.439	64.55
35.3	46.20	46.57	13.014	95.46	40.333	67.01	42.330	63.88
Mean Place	41.231	3.24	8.460	57.80	36.370	81.70	38.030	36.74
Sec δ , Tan δ	2.016	+1.751	1.270	+0.783	1.153	-0.573	1.008	+0.131
$D_{\gamma} \alpha$, $D_{\alpha} \alpha$	+0.07	-0.11	+0.07	-0.05	+0.06	+0.04	+0.06	-0.01
$D_{\gamma} \delta$, $D_{\alpha} \delta$	+0.4	+0.2	+0.4	+0.2	+0.4	+0.2	+0.4	+0.3

APPARENT PLACES OF STARS, 1917.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Phoenicis. Mag. 3.4		μ Cassiopeiae. Mag. 5.3		η Ceti. Mag. 3.6		β Andromedae. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 2	° ' " —47 9	h m 1 2	° ' " +54 30	h m 1 4	° ' " —10 36	h m 1 5	° ' " +35 10
Jan. 0.3	24.100	56.84	45.396	72.47	26.046	76.74	5.937	68.45
10.2	23.872 ²²⁸	57.05 ²¹	45.152 ²⁴¹	72.30 ¹⁷	25.929 ¹¹⁷	77.38 ⁶⁴	5.786 ¹⁵¹	68.02 ⁴³
20.2	23.645 ²²⁷	56.75 ³⁰	44.901 ²⁵¹	71.64 ⁶⁶	25.809 ¹²⁰	77.87 ⁴⁹	5.628 ¹⁵⁸	67.27 ⁷⁵
30.2	23.427 ²¹⁸	55.96 ⁷⁹	44.652 ²⁴⁹	70.51 ¹¹³	25.692 ¹¹⁷	78.14 ²⁷	5.470 ¹⁵⁸	66.23 ¹⁰⁴
Feb. 9.2	23.225 ²⁰²	54.70 ¹²⁶	44.418 ²³⁴	68.97 ¹⁵⁴	25.590 ¹¹²	78.22 ⁸	5.320 ¹⁵⁰	64.93 ¹²⁰
	179	170	204	190	99	15	133	148
19.1	23.046 ¹⁴⁸	53.00	44.214 ¹⁶⁴	67.07 ²¹⁹	25.481 ⁸⁰	78.07 ³⁹	5.187 ¹⁰⁷	63.45 ¹⁶²
Mar. 1.1	22.898 ¹¹¹	50.91 ²⁰⁹	44.050 ¹¹²	64.88 ²³⁶	25.401 ⁵⁵	77.68 ⁶⁸	5.080 ⁷³	61.83 ¹⁶⁶
11.1	22.787 ⁶⁸	48.46 ²⁴⁵	43.938 ⁵¹	62.52 ²⁴⁵	25.346 ²²	77.05 ⁸⁷	5.007 ³²	60.17 ¹⁶³
21.0	22.719 ¹⁸	45.73 ²⁰⁸	43.887 ¹⁷	60.07 ²⁴³	25.323 ¹³	76.18 ¹¹¹	4.975 ¹⁶	58.54 ¹⁵⁴
31.0	22.701 ³⁵	42.75 ³¹⁶	43.904 ⁹⁰	57.64 ²³¹	25.336 ⁵²	75.07 ¹³⁵	4.991 ⁶⁷	57.00 ¹²⁶
Apr. 10.0	22.736 ⁹⁰	39.59 ³²⁶	43.994 ¹⁶³	55.33 ²⁰⁹	25.388 ⁹⁴	73.72 ¹⁵⁸	5.058 ¹²⁰	55.64 ¹¹¹
20.0	22.826 ¹⁴⁶	36.33 ³³²	44.157 ²³⁶	53.24 ¹⁷⁹	25.482 ¹³⁷	72.14 ¹⁷⁷	5.178 ¹⁷²	54.53 ⁸¹
29.9	22.972 ²⁰¹	33.01 ³²⁹	44.393 ³⁰²	51.45 ¹⁴⁴	25.619 ¹⁷⁹	70.37 ¹⁹⁴	5.350 ²²³	53.72 ⁴⁸
May 9.9	23.173 ²⁵²	29.72 ³¹⁹	44.695 ³⁶²	50.01 ¹⁰²	25.798 ²¹⁷	68.43 ²¹⁰	5.573 ²⁶⁷	53.24 ¹⁰
19.9	23.425 ²⁰⁸	26.53 ³⁰²	45.057 ⁴¹²	48.99 ⁵⁶	26.015 ²⁵¹	66.33 ²¹⁷	5.840 ³⁰⁶	53.14 ²⁷
29.9	23.723 ³³⁸	23.51 ²⁷⁹	45.469 ⁴⁵¹	48.43 ¹⁰	26.266 ²⁷⁸	64.16 ²²¹	6.146 ³³⁶	53.41 ⁶⁵
June 8.8	24.061 ³⁶⁷	20.72 ²⁴⁷	45.920 ⁴⁷⁸	48.33 ³⁷	26.544 ³⁰⁰	61.95 ²²⁰	6.482 ³⁵⁸	54.06 ¹⁰¹
18.8	24.428 ³⁸⁸	18.25 ²¹⁰	46.398 ⁴⁹⁴	48.70 ⁸⁴	26.844 ³¹³	59.75 ²¹²	6.840 ³⁶⁹	55.07 ¹²⁴
28.8	24.816 ⁴⁰⁰	16.15 ¹⁶⁸	46.892 ⁴⁹⁵	49.54 ¹²⁷	27.157 ³¹⁸	57.63 ³⁰⁰	7.208 ³⁷³	56.41 ¹⁶⁵
July 8.7	25.216 ³⁹⁸	14.47 ¹²¹	47.387 ⁴⁸⁶	50.81 ¹⁶⁸	27.475 ³¹²	55.63 ¹⁸²	7.582 ³⁶⁶	58.06 ¹⁸⁹
18.7	25.614 ³⁸⁹	13.26 ⁷¹	47.873 ⁴⁶⁶	52.49 ²⁰⁴	27.788 ³⁰⁸	53.81 ¹⁵⁹	7.948 ³⁵¹	59.95 ²¹¹
28.7	26.003 ³⁶⁷	12.55 ¹⁹	48.339 ⁴³⁷	54.53 ²³⁴	28.091 ²⁸⁵	52.22 ¹³³	8.299 ³⁰⁰	62.06 ²²⁶
Aug. 7.7	26.370 ³³⁶	12.36 ³⁴	48.776 ⁴⁰⁰	56.87 ²⁶¹	28.376 ²⁶¹	50.39 ¹⁰¹	8.629 ³⁰⁰	64.32 ²³⁶
17.6	26.706 ²⁹⁶	12.70 ⁸³	49.176 ³⁵⁶	59.48 ²⁸⁰	28.637 ²³¹	49.88 ⁷⁰	8.929 ²⁶⁷	66.68 ²⁴¹
27.6	27.002 ²⁵⁰	13.53 ¹³¹	49.532 ³⁰⁷	62.28 ²⁹⁴	28.868 ¹⁹⁶	49.18 ³⁹	9.196 ²³²	69.09 ²⁴²
Sept. 6.6	27.252 ¹⁹⁹	14.84 ¹⁷²	49.839 ²⁵⁶	65.22 ³⁰³	29.066 ¹⁶⁸	48.79 ⁷	9.428 ¹⁹²	71.51 ²³⁷
16.6	27.451 ¹⁴⁵	16.56 ²⁰⁸	50.095 ²⁰²	68.25 ³⁰⁴	29.229 ¹²⁷	48.72 ²⁴	9.620 ¹⁵³	73.88 ²²⁹
26.5	27.596 ⁸⁹	18.64 ²³⁴	50.297 ¹⁴⁸	71.29 ²⁹⁸	29.356 ⁹²	48.96 ⁵⁰	9.773 ¹¹³	76.17 ²¹⁵
Oct. 6.5	27.685 ³⁴	20.98 ²⁵¹	50.445 ⁹³	74.27 ²⁹⁰	29.448 ⁵⁷	49.46 ⁷⁵	9.886 ⁸⁹	78.32 ²⁰⁰
16.5	27.719 ¹⁸	23.49 ²⁵⁸	50.538 ⁴²	77.17 ²⁷⁴	29.505 ²⁴	50.21 ⁹¹	9.961 ³⁹	80.32 ¹⁸⁰
26.4	27.701 ⁶⁷	26.07 ²⁵⁵	50.580 ⁹	79.91 ²⁵¹	29.529 ⁴	51.12 ¹⁰⁴	10.000 ⁵	82.12 ¹⁵⁷
Nov. 5.4	27.634 ¹¹⁰	28.62 ²⁴¹	50.571 ⁵⁸	82.42 ²²³	29.525 ³¹	52.16 ¹¹¹	10.005 ²⁸	83.69 ¹²³
15.4	27.524 ¹⁴⁷	31.03 ²¹⁷	50.513 ¹⁰⁴	84.65 ¹⁸⁹	29.494 ⁵⁴	53.27 ¹¹⁴	9.977 ⁵⁸	85.02 ¹⁰⁴
25.4	27.377 ¹⁷⁸	33.20 ¹⁸⁶	50.409 ¹⁴⁴	86.54 ¹⁵¹	29.440 ⁷⁵	54.41 ¹⁰³	9.919 ¹⁰⁹	86.06 ⁷⁴
Dec. 5.3	27.199 ²⁰²	35.06 ¹⁴⁵	50.285 ¹⁶¹	88.05 ¹⁰⁷	29.365 ⁹¹	55.52 ¹⁰³	9.834 ¹⁰⁹	86.80 ⁴³
15.3	26.997 ²¹⁹	36.51 ¹⁰²	50.084 ²¹⁴	89.12 ⁶¹	29.274 ¹⁰⁴	56.55 ⁹²	9.725 ¹³⁰	87.23 ⁸
25.3	26.778 ²²⁹	37.53 ⁵³	49.870 ²³⁶	89.73 ¹³	29.170 ¹¹⁵	57.47 ⁷⁹	9.595 ¹⁴⁸	87.31 ²⁵
35.3	26.549	38.06	49.634	89.86	29.055	58.26	9.447	87.06
Mean Place	22.806	48.05	44.206	49.74	24.862	78.66	4.762	50.85
Sec δ , Tan δ	1.471	-1.079	1.723	+1.403	1.017	-0.187	1.223	+0.705
D ϕ α , D ω α	+0.05	+0.07	+0.07	-0.09	+0.06	+0.01	+0.07	-0.05
D ϕ δ , D ω δ	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Piscium. Mag. 4.7		ζ Piscium. Mag. 5.6		κ Tucanae. Mag. 5.0		f Piscium. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 7	° ' " +29 38	h m 1 9	° ' " + 7 8	h m 1 12	° ' " -69 18	h m 1 13	° ' " + 3 10
Jan. 0.3	6.276	73.39	24.792	20.55	59.02	73.55	32.212	46.46
10.2	6.140	72.90	24.683	19.88	58.47	73.43	32.103	45.77
20.2	5.997	72.15	24.567	19.20	57.92	72.72	31.986	45.11
30.2	5.853	71.17	24.450	18.53	57.39	71.42	31.869	44.52
Feb. 9.2	5.716	69.98	24.339	17.89	56.90	69.58	31.757	43.99
19.1	5.595	68.66	24.239	17.32	56.46	67.26	31.653	43.58
Mar. 1.1	5.495	67.25	24.159	16.86	56.08	64.51	31.569	43.29
11.1	5.428	65.84	24.102	16.53	55.78	61.41	31.509	43.19
21.1	5.399	64.47	24.078	16.38	55.57	58.03	31.481	43.26
31.0	5.413	63.24	24.091	16.42	55.44	54.42	31.488	43.53
Apr. 10.0	5.475	62.17	24.145	16.71	55.40	50.70	31.535	44.06
20.0	5.588	61.37	24.241	17.23	55.46	46.94	31.623	44.81
29.9	5.750	60.85	24.380	18.01	55.63	43.20	31.759	45.80
May 9.9	5.959	60.66	24.562	19.03	55.90	39.58	31.935	47.04
19.9	6.212	60.82	24.783	20.31	56.25	36.17	32.148	48.49
29.9	6.500	61.32	25.037	21.79	56.69	33.02	32.398	50.13
June 8.8	6.820	62.17	25.318	23.46	57.21	30.21	32.675	51.94
18.8	7.159	63.34	25.621	25.26	57.79	27.82	32.972	53.83
28.8	7.512	64.81	25.936	27.16	58.42	25.90	33.281	55.77
July 8.8	7.867	66.53	26.264	29.10	59.07	24.50	33.596	57.73
18.7	8.216	68.44	26.570	31.04	59.74	23.65	33.910	59.66
28.7	8.553	70.53	26.873	32.93	60.40	23.38	34.213	61.49
Aug. 7.7	8.868	72.71	27.160	34.71	61.03	23.71	34.498	63.15
17.6	9.157	74.95	27.423	36.33	61.62	24.62	34.762	64.66
27.6	9.413	77.19	27.658	37.78	62.14	26.06	34.999	65.96
Sept. 6.6	9.636	79.40	27.861	39.02	62.58	28.00	35.204	67.00
16.6	9.822	81.53	28.031	40.04	62.93	30.36	35.375	67.82
26.5	9.970	83.54	28.167	40.82	63.17	33.08	35.512	68.37
Oct. 6.5	10.081	85.40	28.268	41.38	63.31	36.04	35.616	68.68
16.5	10.155	87.08	28.336	41.72	63.34	39.13	35.687	68.77
26.5	10.196	88.57	28.374	41.85	63.26	42.22	35.728	68.65
Nov. 5.4	10.204	89.83	28.382	41.80	63.06	45.20	35.738	68.36
15.4	10.181	90.86	28.365	41.58	62.78	47.96	35.725	67.94
25.4	10.133	91.63	28.325	41.23	62.41	50.36	35.686	67.40
Dec. 5.3	10.058	92.15	28.265	40.77	61.97	52.32	35.625	66.78
15.3	9.961	92.37	28.185	40.22	61.47	53.78	35.547	66.08
25.3	9.843	92.32	28.090	39.60	60.94	54.66	35.453	65.39
35.3	9.712	91.98	27.983	38.93	60.39	54.94	35.347	64.68
Mean Place	5.091	57.55	23.597	12.37	57.309	61.27	30.988	39.65
Sec δ , Tan δ	1.151	+0.569	1.008	+0.125	2.831	-2.648	1.002	+0.056
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	+0.07	-0.04	+0.06	-0.01	+0.04	+0.18	+0.06	0.00
$D_{\delta} \delta$, $D_{\alpha} \delta$	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	υ Piscium. Mag. 4.7		θ Ceti. Mag. 3.8		δ Cassiopeiae. Mag. 2.8		γ Phoenicis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 14	° ' " +26 49	h m 1 19	° ' " - 8 36	h m 1 20	° ' " +59 48	h m 1 24	° ' " -43 44
Jan. 0.3	55.262	56.29	53.713	37.99	23.925	39.99	47.124	43.97
10.3	55.132	55.82	53.597	38.70	23.622	40.18	46.912	44.48
20.2	54.994	55.10	53.475	39.26	23.304	39.84	46.697	44.51
30.2	54.854	54.19	53.352	39.64	22.984	38.98	46.485	44.05
Feb. 9.2	54.718	53.11	53.233	39.81	22.678	37.65	46.281	43.13
19.1	54.596	51.90	53.124	39.78	22.400	35.90	46.094	41.75
Mar. 1.1	54.494	50.63	53.032	39.52	22.165	33.81	45.932	39.97
11.1	54.423	49.36	52.964	39.04	21.986	31.47	45.803	37.82
21.1	54.387	48.16	52.926	38.31	21.877	28.98	45.713	35.33
31.0	54.394	47.07	52.922	37.34	21.846	26.44	45.667	32.58
Apr. 10.0	54.447	46.16	52.959	36.13	21.899	23.96	45.671	29.60
20.0	54.549	45.50	53.038	34.70	22.037	21.64	45.728	26.48
30.0	54.700	45.13	53.160	33.04	22.260	19.57	45.839	23.24
May 9.9	54.898	45.05	53.325	31.21	22.560	17.84	46.005	20.00
19.9	55.139	45.31	53.530	29.22	22.933	16.50	46.222	16.80
29.9	55.416	45.90	53.769	27.11	23.366	15.59	46.486	13.73
June 8.8	55.724	46.80	54.039	24.96	23.848	15.15	46.789	10.83
18.8	56.054	48.00	54.330	22.80	24.366	15.18	47.126	8.21
28.8	56.397	49.47	54.638	20.68	24.907	15.70	47.488	5.92
July 8.8	56.745	51.17	54.952	18.66	25.455	16.68	47.865	4.01
18.7	57.089	53.05	55.265	16.80	25.999	18.10	48.246	2.54
28.7	57.422	55.06	55.569	15.16	26.526	19.92	48.621	1.55
Aug. 7.7	57.734	57.17	55.858	13.76	27.025	22.11	48.980	1.08
17.7	58.023	59.30	56.125	12.64	27.486	24.60	49.314	1.12
27.6	58.281	61.41	56.386	11.84	27.903	27.34	49.616	1.67
Sept. 6.6	58.506	63.48	56.575	11.34	28.268	30.28	49.877	2.71
16.6	58.697	65.45	56.751	11.17	28.578	33.36	50.093	4.20
26.5	58.851	67.30	56.892	11.30	28.829	36.51	50.260	6.06
Oct. 6.5	58.968	68.98	56.999	11.70	29.018	39.68	50.378	8.26
16.5	59.051	70.50	57.072	12.34	29.147	42.80	50.445	10.68
26.5	59.101	71.82	57.113	13.17	29.214	45.79	50.461	13.21
Nov. 5.4	59.119	72.93	57.124	14.14	29.220	48.62	50.432	15.78
15.4	59.106	73.82	57.107	15.21	29.166	51.19	50.359	18.26
25.4	59.067	74.47	57.067	16.32	29.056	53.46	50.249	20.58
Dec. 5.4	59.001	74.88	57.003	17.41	28.892	55.36	50.105	22.60
15.3	58.913	75.03	56.921	18.46	28.678	56.83	49.935	24.29
25.3	58.805	74.94	56.823	19.41	28.422	57.83	49.743	25.56
35.3	58.680	74.59	56.710	20.24	28.133	58.31	49.534	26.39
Mean Place	54.019	41.37	52.444	40.68	22.443	16.27	45.714	36.23
Sec δ , Tan δ	1.121	+0.506	1.011	-0.151	1.988	+1.718	1.384	-0.957
$D\psi a$, $D_{\omega} a$	+0.06	-0.03	+0.06	+0.01	+0.08	-0.11	+0.05	+0.06
$D\psi \delta$, $D_{\omega} \delta$	+0.4	+0.3	+0.4	+0.3	+0.4	+0.3	+0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	38 Cassiopeiae. Mag. 6.0			77 Piscium. Mag. 3.7			40 Cassiopeiae. Mag. 5.5			v Andromedæ. Mag. 4.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	1 25		+69 50	1 27		+14 55	1 31		+72 37	1 31		+40 59
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.3	3.61	49	42.28 48	3.648	113	16.93 56	53.40	68	29.31 68	56.584	185	45.90 13
10.3	3.12	51	42.76 11	3.535	122	16.35 68	52.84	61	29.94 3	56.419	180	45.77 48
20.2	2.61	51	42.65 66	3.413	127	15.67 74	52.23	61	29.97 55	56.239	186	45.29 34
30.2	2.10	49	41.97 123	3.286	125	14.93 79	51.62	59	29.42 113	56.053	182	44.45 116
Feb. 9.2	1.61	45	40.74 173	3.161	114	14.14 80	51.03	54	28.29 164	55.871	169	43.29 142
19.1	1.16	37	39.01 214	3.047	99	13.34 77	50.49	46	26.65 209	55.702	146	41.87 163
Mar. 1.1	0.79	30	36.87 248	2.948	74	12.57 69	50.03	37	24.56 245	55.556	112	40.24 176
11.1	0.49	20	34.39 269	2.874	48	11.88 58	49.66	26	22.11 270	55.444	70	38.48 181
21.1	0.29	8	31.70 279	2.831	4	11.30 42	49.40	13	19.41 283	55.374	20	36.67 179
31.0	0.21	4	28.91 278	2.827	38	10.88 20	49.27	2	16.58 286	55.354	34	34.88 166
Apr. 10.0	0.25	16	26.13 269	2.865	83	10.68 2	49.29	16	13.72 278	55.388	94	33.22 149
20.0	0.41	28	23.44 246	2.948	128	10.70 26	49.45	29	10.94 266	55.482	151	31.73 128
30.0	0.69	39	20.98 214	3.076	173	10.98 54	49.74	42	8.38 280	55.633	206	30.50 93
May 9.9	1.08	49	18.84 177	3.249	214	11.52 83	50.16	55	6.08 192	55.839	259	29.57 58
19.9	1.57	60	17.07 123	3.463	261	12.35 108	50.71	65	4.16 149	56.098	303	28.99 20
29.9	2.17	65	15.74 84	3.714	280	13.43 131	51.36	73	2.67 102	56.401	341	28.79 18
June 8.8	2.82	70	14.90 35	3.994	304	14.74 151	52.09	79	1.65 51	56.742	369	28.97 56
18.8	3.52	74	14.55 17	4.298	319	16.25 169	52.88	83	1.14 1	57.111	386	29.53 92
28.8	4.26	76	14.72 68	4.617	326	17.94 180	53.71	86	1.15 52	57.497	396	30.45 128
July 8.8	5.02	75	15.40 116	4.942	326	19.74 187	54.57	85	1.67 102	57.893	394	31.73 158
18.7	5.77	73	16.56 163	5.267	315	21.61 189	55.42	84	2.69 149	58.287	385	33.31 184
28.7	6.50	70	18.19 206	5.582	299	23.50 187	56.26	80	4.18 193	58.672	366	35.15 207
Aug. 7.7	7.20	65	20.25 243	5.881	279	25.37 180	57.06	75	6.11 233	59.038	340	37.22 223
17.7	7.85	57	22.68 275	6.160	251	27.17 168	57.81	68	8.44 268	59.378	310	39.45 225
27.6	8.42	52	25.43 302	6.411	222	28.85 155	58.49	69	11.12 297	59.688	275	41.80 242
Sept. 6.6	8.94	44	28.45 322	6.633	190	30.40 188	59.09	52	14.09 320	59.963	237	44.22 245
16.6	9.38	36	31.67 335	6.823	156	31.78 117	59.61	42	17.29 326	60.200	197	46.67 242
26.5	9.74	26	35.02 348	6.979	123	32.95 99	60.03	33	20.65 346	60.397	156	49.09 236
Oct. 6.5	10.00	18	38.45 344	7.102	91	33.94 78	60.36	22	24.11 349	60.553	116	51.45 224
16.5	10.18	8	41.89 336	7.193	58	34.72 59	60.58	10	27.60 345	60.669	75	53.69 209
26.5	10.26	1	45.25 321	7.251	29	35.31 40	60.68	1	31.05 332	60.744	37	55.78 191
Nov. 5.4	10.25	10	48.46 298	7.280	2	35.71 21	60.69	10	34.37 311	60.781	0	57.69 167
15.4	10.15	18	51.44 269	7.282	25	35.92 4	60.59	21	37.48 284	60.781	38	59.36 142
25.4	9.97	27	54.13 281	7.257	49	35.96 11	60.38	32	40.32 247	60.743	72	60.78 112
Dec. 5.4	9.70	36	56.44 186	7.208	71	35.85 27	60.06	40	42.79 203	60.671	104	61.90 80
15.3	9.34	41	58.30 136	7.137	91	35.58 40	59.66	48	44.82 163	60.567	131	62.70 45
25.3	8.93	46	59.66 82	7.046	107	35.18 53	59.18	54	46.35 97	60.436	157	63.15 8
35.3	8.47		60.48	6.939		34.65	58.64		47.32	60.279		63.23
Mean Place	1.814		16.94	2.336		6.06	51.309		3.69	55.147		26.87
Sec δ , Tan δ	2.902		+2.724	1.035		+0.266	3.347		+3.195	1.325		+0.869
$D_{\delta} \alpha$, $D_{\alpha} \alpha$	+0.09		-0.18	+0.06		-0.02	+0.09		-0.20	+0.07		-0.05
$D_{\delta} \delta$, $D_{\alpha} \delta$	+0.4		+0.4	+0.4		+0.4	+0.4		+0.4	+0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Piscum. Mag. 5.6		υ Persei. Mag. 3.8		α Eridani. (Achernar.) Mag. 0.6		ω Cassiopeie. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 32	° ' " +11 43	h m 1 32	° ' " +48 12	h m 1 34	° ' " -57 38	h m 1 36	° ' " +67 37
	s	"	s	"	s	"	s	"
Jan. 0.3	43.094	12.09	54.863	50.20	39.082	100.04	12.35	50.63
10.3	42.984	11.49	54.665	50.26	38.752	100.45	11.93	51.19
20.2	42.863	10.83	54.448	49.88	38.416	100.31	11.49	51.18
30.2	42.738	10.14	54.226	49.08	38.084	99.61	11.08	50.61
Feb. 9.2	42.613	9.44	54.009	47.89	37.765	98.37	10.58	49.50
19.2	42.498	8.75	53.807	46.37	37.472	96.63	10.17	47.89
Mar. 1.1	42.398	8.12	53.633	44.59	37.212	94.44	9.82	45.86
11.1	42.321	7.59	53.498	42.62	36.995	91.84	9.53	43.51
21.1	42.274	7.19	53.412	40.55	36.829	88.91	9.33	40.92
31.0	42.264	6.97	53.382	38.45	36.722	85.71	9.23	38.21
Apr. 10.0	42.295	6.94	53.415	36.44	36.680	82.30	9.24	35.48
20.0	42.370	7.16	53.515	34.60	36.706	78.76	9.38	32.86
30.0	42.490	7.61	53.679	33.01	36.803	75.16	9.61	30.43
May 9.9	42.655	8.33	53.906	31.72	36.969	71.59	9.95	28.29
19.9	42.860	9.29	54.191	30.78	37.204	68.14	10.38	26.51
29.9	43.102	10.50	54.526	30.25	37.501	64.85	10.90	25.15
June 8.9	43.375	11.91	54.901	30.13	37.854	61.82	11.50	24.25
18.8	43.673	13.51	55.309	30.43	38.253	59.13	12.14	23.84
28.8	43.985	15.23	55.736	31.14	38.689	56.84	12.81	23.93
July 8.8	44.306	17.05	56.173	32.24	39.149	55.00	13.50	24.51
18.7	44.627	18.91	56.608	33.70	39.621	53.67	14.20	25.58
28.7	44.940	20.77	57.033	35.49	40.091	52.89	14.88	27.09
Aug. 7.7	45.238	22.58	57.438	37.57	40.547	52.68	15.53	29.02
17.7	45.517	24.26	57.816	39.86	40.975	53.04	16.14	31.32
27.6	45.769	25.84	58.160	42.34	41.364	53.97	16.69	33.95
Sept. 6.6	45.992	27.24	58.466	44.96	41.704	55.42	17.19	36.83
16.6	46.185	28.45	58.729	47.64	41.986	57.35	17.62	39.94
26.6	46.345	29.45	58.948	50.34	42.205	59.67	17.97	43.18
Oct. 6.5	46.471	30.23	59.122	53.01	42.353	62.33	18.25	46.50
16.5	46.566	30.82	59.250	55.60	42.432	65.19	18.45	49.84
26.5	46.629	31.20	59.333	58.08	42.441	68.16	18.56	53.12
Nov. 5.4	46.662	31.39	59.371	60.37	42.381	71.12	18.59	56.28
15.4	46.668	31.42	59.365	62.43	42.259	73.95	18.54	59.22
25.4	46.647	31.29	59.317	64.23	42.080	76.53	18.41	61.89
Dec. 5.4	46.603	31.02	59.228	65.69	41.852	78.78	18.20	64.22
15.3	46.535	30.64	59.101	66.80	41.582	80.60	17.91	66.11
25.3	46.448	30.15	58.941	67.52	41.280	81.92	17.55	67.52
35.3	46.345	29.58	58.753	67.82	40.957	82.71	17.15	68.40
Mean Place	41.751	2.35	53.356	29.27	37.452	89.67	10.410	25.81
Sec δ , Tan δ	1.021	+0.207	1.500	+1.119	1.869	-1.579	2.628	+2.430
$D\psi\alpha$, $D_\omega\alpha$	+0.06	-0.01	+0.07	-0.07	+0.04	+0.10	+0.09	-0.15
$D\psi\delta$, $D_\omega\delta$	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♄ Piscium. Mag. 4.7			♋ Persei. Mag. 4.2			♌ Ceti. Mag. 3.6			♍ Piscium. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 1 37	s + 5 4	° ' "	h m 1 38	s +50 16	° ' "	h m 1 40	s -16 21	° ' "	h m 1 41	s + 8 44	° ' "
Jan. 0.3	7.980	12.38		28.556	37.44		14.065	86.76		1.908	34.14	
10.3	7.874	11.71	67	28.346	37.60	16	13.938	87.51	75	1.801	33.52	62
20.2	7.754	11.06	65	28.118	37.31	29	13.802	88.03	52	1.681	32.87	65
30.2	7.630	10.44	62	27.882	36.58	73	13.662	88.27	24	1.555	32.22	65
Feb. 9.2	7.507	9.89	55	27.649	35.46	112	13.523	88.24	3	1.429	31.59	63
	116		47	217		149	131		33	118		58
19.2	7.391	9.42	35	27.432	33.97	179	13.392	87.91	61	1.311	31.01	50
Mar. 1.1	7.290	9.07	21	27.241	32.18	199	13.278	87.30	87	1.205	30.51	39
11.1	7.210	8.86	5	27.091	30.18	213	13.185	86.43	116	1.123	30.12	23
21.1	7.160	8.81	16	26.992	28.06	215	13.122	85.27	141	1.068	29.89	6
31.0	7.145	8.97	37	26.953	25.91	209	13.094	83.86	167	1.050	29.83	15
Apr. 10.0	7.169	9.34	61	26.977	23.82	195	13.105	82.19	189	1.073	29.98	37
20.0	7.237	9.95	84	27.070	21.87	171	13.160	80.30	209	1.138	30.35	63
30.0	7.350	10.79	108	27.231	20.16	142	13.259	78.21	233	1.249	30.98	85
May 9.9	7.505	11.87	130	27.458	18.74	106	13.403	75.98	262	1.404	31.83	110
19.9	7.702	13.17	148	27.746	17.68	67	13.588	73.63	242	1.601	32.93	132
	232		181	341		126	223		186	234		150
29.9	7.934	14.65	168	28.087	17.01	26	13.811	71.21	242	1.835	34.25	167
June 8.9	8.199	16.33	178	28.471	16.75	17	14.068	68.79	287	2.101	35.75	177
18.8	8.488	18.11	186	28.888	16.92	59	14.350	66.42	301	2.391	37.42	183
28.8	8.795	19.97	192	29.329	17.51	99	14.651	64.15	311	2.699	39.19	185
July 8.8	9.110	21.89	187	29.780	18.50	172	14.962	62.07	315	3.016	41.02	182
	316		181	441		201	308		159	312		174
18.7	9.426	23.76	168	30.231	19.86	225	15.277	60.21	277	3.334	42.87	160
28.7	9.733	25.57	152	30.672	21.58	246	15.585	58.62	252	3.646	44.69	144
Aug. 7.7	10.030	27.25	111	31.095	23.59	262	15.881	57.36	17	3.945	46.43	125
17.7	10.306	28.77	87	31.490	25.84	270	16.158	56.43	20	4.225	48.03	105
27.6	10.557	30.10	62	31.852	28.30	274	16.410	55.88	53	4.480	49.47	83
	222		40	323		288	222		129	229		65
Sept. 6.6	10.779	31.21	22	32.175	30.92	294	16.632	55.71	143	4.709	50.72	41
16.6	10.972	32.08	8	32.456	33.62	218	16.822	55.91	150	4.906	51.77	29
26.6	11.132	32.70	19	32.691	36.36	192	16.976	56.44	159	5.072	52.60	17
Oct. 6.5	11.260	33.10	56	32.880	39.10	124	17.096	57.28	62	5.208	53.19	1
16.5	11.356	33.26	67	33.021	41.78	84	17.180	58.39	113	5.308	53.58	15
	64		4	94		256	51		129	70		30
26.5	11.420	33.22	22	33.115	44.34	19	17.231	59.68	143	5.378	53.75	1
Nov. 5.4	11.455	33.00	36	33.161	46.75	12	17.250	61.11	150	5.420	53.76	15
15.4	11.463	32.64	48	33.161	48.93	84	17.238	62.61	150	5.433	53.61	30
25.4	11.444	32.16	56	33.116	50.85	159	17.199	64.11	143	5.419	53.31	41
Dec. 5.4	11.402	31.60	64	33.027	52.44	124	17.135	65.54	130	5.382	52.90	49
	65		69	130		84	86		113	62		56
15.3	11.337	30.96	67	32.897	53.68	106	17.049	66.84	93	5.320	52.41	62
25.3	11.253	30.29	69	32.730	54.52	122	16.943	67.97	101	5.238	51.85	62
35.3	11.152	29.60		32.534	54.93		16.821	68.90		5.137	51.23	
Mean Place	6.617	4.95		26.963	16.10		12.695	86.83		0.516	25.46	
Sec δ , Tan δ	1.004	+0.089		1.565	+1.203		1.042	-0.294		1.012	+0.154	
D ψ α , D ω α	+0.06	-0.01		+0.07	-0.07		+0.06	+0.02		+0.06	-0.01	
D ψ δ , D ω δ	+0.4	+0.4		+0.4	+0.4		+0.4	+0.4		+0.4	+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sculptoris. Mag. 5.4			ζ Ceti. Mag. 3.9			α Trianguli. Mag. 3.6			ε Cassiopeise. Mag. 3.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 1 41	s	° ' "	h m 1 47	s	° ' "	h m 1 48	s	° ' "	h m 1 48	s	° ' "
			-25 27			-10 44			+29 10			+63 15
Jan. 0.3	46.709		63.43	23.205		38.36	22.253		45.45	26.49		67.01
10.3	46.568	141	64.24	23.090	115	39.18	22.125	128	45.19	26.16	33	67.60
20.2	46.418	150	64.72	22.963	127	39.80	21.983	142	44.69	25.80	36	67.66
30.2	46.264	154	64.84	22.831	132	40.22	21.831	152	43.96	25.43	37	67.18
Feb. 9.2	46.111	153	64.61	22.698	133	40.41	21.678	153	43.05	25.06	37	66.18
19.2	45.966	145	64.03	22.570	128	40.37	21.532	146	41.97	24.71	35	64.72
Mar. 1.1	45.838	128	63.11	22.457	113	40.08	21.401	131	40.76	24.40	31	62.85
11.1	45.733	105	61.86	22.364	93	39.54	21.297	104	39.50	24.14	26	60.65
21.1	45.659	74	60.28	22.299	65	38.75	21.227	70	38.25	23.96	18	58.23
31.1	45.621	3	58.44	22.267	32	37.71	21.198	117	37.08	23.87	9	55.68
Apr. 10.0	45.624		56.34	22.275		36.42	21.215		36.03	23.86		53.10
20.0	45.671	47	54.02	22.324	49	34.90	21.282	67	35.17	23.95	9	50.61
30.0	45.764	93	51.53	22.419	95	33.17	21.401	119	34.55	24.14	19	48.29
May 9.9	45.905	141	48.91	22.557	138	31.25	21.570	169	34.20	24.41	27	46.25
19.9	46.090	185	46.22	22.738	181	29.19	21.786	216	34.15	24.78	37	44.54
29.9	46.315	225	43.51	22.957	219	27.01	22.045	269	34.41	25.22	44	43.23
June 8.9	46.576	261	40.86	23.209	252	24.79	22.338	293	34.98	25.71	49	42.35
18.8	46.865	289	38.34	23.487	278	22.56	22.659	321	35.86	26.26	55	41.94
28.8	47.176	311	35.98	23.784	297	20.40	23.000	341	37.02	26.84	58	42.00
July 8.8	47.498	328	33.87	24.094	310	18.34	23.352	352	38.41	27.44	60	42.53
18.8	47.826	328	32.06	24.408	314	16.44	23.704	362	40.02	28.04	60	43.52
28.7	48.150	324	30.60	24.716	308	14.78	24.052	348	41.78	28.64	60	44.94
Aug. 7.7	48.462	312	29.52	25.014	298	13.37	24.386	334	43.66	29.22	58	46.74
17.7	48.756	294	28.86	25.295	281	12.27	24.699	313	45.61	29.76	54	48.91
27.6	49.023	267	28.64	25.552	267	11.50	24.988	289	47.59	30.27	51	51.39
Sept. 6.6	49.262	239	28.85	25.783	231	11.07	25.247	260	49.56	30.72	45	54.10
16.6	49.465	203	29.47	25.982	199	10.97	25.474	227	51.47	31.12	40	57.02
26.6	49.631	166	30.48	26.148	166	11.21	25.669	24	53.29	31.44	32	60.09
Oct. 6.5	49.760	129	31.80	26.282	134	11.74	25.828	159	55.00	31.71	27	63.23
16.5	49.851	91	33.40	26.382	100	12.54	25.952	124	56.56	31.92	21	66.38
26.5	49.905	54	35.18	26.449	67	13.54	26.043	91	57.97	31.92	14	68.38
Nov. 5.5	49.924	19	37.08	26.486	37	14.70	26.100	57	59.19	32.12	6	69.48
15.4	49.909	15	39.02	26.494	8	15.96	26.124	24	60.23	32.12	0	72.46
25.4	49.864	45	40.91	26.473	21	17.25	26.117	7	61.06	32.12	7	75.27
Dec. 5.4	49.791	73	42.68	26.427	46	18.52	26.079	38	61.66	32.05	7	77.82
15.3	49.694	97	44.24	26.357	70	19.73	26.012	67	62.04	31.89	16	80.04
25.3	49.576	118	45.57	26.268	89	20.82	25.918	94	62.16	31.69	26	81.89
35.3	49.441	135	46.61	26.160	108	21.77	25.800	118	62.03	31.43	26	83.28
										31.12	31	84.16
Mean Place	45.290		60.82	21.784		40.43	20.746		30.12	24.487		43.20
Sec δ, Tan δ	1.108		-0.476	1.018		-0.190	1.145		+0.558	2.223		+1.985
Dψ a, Dω a	+0.06		+0.03	+0.06		+0.01	+0.07		-0.03	+0.08		-0.12
Dψ δ, Dω δ	+0.4		+0.4	+0.4		+0.5	+0.4		+0.5	+0.4		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Piscium. Mag. 4.8		β Arietis. Mag. 2.7		ψ Phoenicis. Mag. 4.4		ν Ceti. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 49	° ' " + 2 46	h m 1 50	° ' " +20 24	h m 1 50	° ' " -46 41	h m 1 56	° ' " -21 28
	s	"	s	"	s	"	s	"
Jan. 0.3	16.855	48.36	4.536	22.54	20.591	100.86	7.101	47.42
10.3	16.750 ¹⁰⁵	47.67 ⁶⁰	4.423 ¹¹³	22.13 ⁴¹	20.361 ²³⁰	101.63 ⁷⁷	6.971 ¹³⁰	48.34 ⁹²
20.2	16.631 ¹¹⁹	47.02 ⁶⁵	4.295 ¹²⁸	21.56 ⁵⁷	20.121 ²⁴⁰	101.90 ²⁷	6.828 ¹⁴³	48.94 ⁶⁰
30.2	16.505 ¹²⁶	46.43 ⁵⁹	4.158 ¹³⁷	20.85 ⁷¹	19.877 ²⁴⁴	101.65 ²⁵	6.678 ¹⁵⁰	49.23 ²⁰
Feb. 9.2	16.377 ¹²⁸	45.92 ⁵¹	4.020 ¹³⁸	20.05 ⁸⁰	19.637 ²⁴⁰	100.90 ⁷⁵	6.527 ¹⁵¹	49.20 ³
	123	39	133	88	226	123	145	36
19.2	16.254 ¹⁰⁹	45.53 ²⁵	3.887 ¹¹⁸	19.17 ⁹¹	19.411 ²⁰⁴	99.67 ¹⁶⁸	6.382 ¹³³	48.84 ⁶⁰
Mar. 1.1	16.145 ⁹⁰	45.28 ¹¹	3.769 ⁹⁷	18.26 ⁸⁹	19.207 ¹⁷⁶	97.99 ²⁰⁸	6.249 ¹¹¹	48.15 ¹⁰⁰
11.1	16.055 ⁶¹	45.17 ⁷	3.672 ⁶⁵	17.37 ⁸³	19.031 ¹³⁶	95.91 ²⁴⁵	6.138 ⁸⁴	47.15 ¹³¹
21.1	15.994 ²⁷	45.24 ²⁸	3.607 ²⁷	16.54 ⁷¹	18.895 ⁹⁰	93.46 ²⁷⁵	6.054 ⁹	45.84 ¹⁸⁵
31.1	15.967 ¹²	45.52 ⁴⁹	3.580 ¹⁵	15.83 ⁵⁵	18.805 ⁴⁰	90.71 ³⁰¹	6.005 ³⁴	44.24 ²⁰⁹
Apr. 10.0	15.979 ⁵⁵	46.01 ⁷²	3.595 ⁶²	15.28 ³⁵	18.765 ¹⁵	87.70 ³¹⁸	5.996 ⁸⁰	42.39 ²²⁸
20.0	16.034 ¹⁰⁰	46.73 ⁹⁵	3.657 ¹¹⁰	14.93 ¹¹	18.780 ⁷³	84.52 ³³¹	6.030 ¹²⁶	40.30 ²⁴³
30.0	16.134 ¹⁴³	47.68 ¹¹⁹	3.767 ¹⁵⁷	14.82 ¹⁶	18.853 ¹³¹	81.21 ³³⁶	6.110 ¹⁷¹	38.02 ²⁵³
May 9.9	16.277 ¹⁸⁴	48.87 ¹³⁸	3.924 ²⁰²	14.98 ⁴²	18.984 ¹⁸⁸	77.85 ³²⁴	6.236 ²¹¹	35.59 ²⁵⁶
19.9	16.461 ²²⁴	50.25 ¹⁵⁸	4.126 ²⁴¹	15.40 ⁷¹	19.172 ²³⁹	74.51 ³²⁴	6.407 ²⁴⁸	33.06 ²⁶⁰
29.9	16.685 ²⁵⁶	51.83 ¹⁷²	4.367 ²⁷⁵	16.11 ⁹⁶	19.411 ²⁸⁶	71.27 ³⁰⁶	6.618 ²⁷⁶	30.47 ²⁵⁶
June 8.9	16.941 ²⁸¹	53.55 ¹⁸³	4.642 ³⁰²	17.07 ¹²⁰	19.697 ³²⁵	68.22 ²⁸¹	6.866 ³⁰⁰	27.91 ²⁶⁰
18.8	17.222 ³⁰⁰	55.38 ¹⁸⁹	4.944 ³²¹	18.27 ¹⁴¹	20.022 ³⁵⁶	65.41 ²⁴⁸	7.142 ³¹⁴	25.41 ²³⁶
28.8	17.522 ³¹¹	57.27 ¹⁹¹	5.265 ³³¹	19.68 ¹⁵⁹	20.378 ³⁷⁷	62.93 ²⁰⁹	7.442 ³²⁰	23.05 ²¹⁵
July 8.8	17.833 ³¹⁴	59.18 ¹⁸⁶	5.596 ³³³	21.27 ¹⁷⁰	20.755 ³⁸⁹	60.84 ¹⁶⁵	7.756 ³²⁰	20.90 ¹⁹⁰
18.8	18.147 ³¹⁰	61.04 ¹⁷⁷	5.929 ³²⁹	22.97 ¹⁷⁸	21.144 ³⁸⁹	59.19 ¹¹⁶	8.076 ³²⁰	19.00 ¹⁵⁸
28.7	18.457 ²⁹⁷	62.81 ¹⁶²	6.258 ³¹⁶	24.75 ¹⁸²	21.533 ³⁸⁰	58.03 ⁶³	8.396 ³⁰⁷	17.42 ¹²²
Aug. 7.7	18.754 ²⁸⁰	64.43 ¹⁴⁵	6.574 ²⁹⁷	26.57 ¹⁸¹	21.913 ³⁶⁰	57.40 ¹⁰	8.703 ²⁹³	16.20 ⁸⁴
17.7	19.034 ²⁵⁷	65.88 ¹²³	6.871 ²⁷⁴	28.38 ¹⁷⁶	22.273 ³³²	57.30 ⁴⁶	8.996 ²⁷¹	15.36 ⁴²
27.6	19.291 ²³²	67.11 ¹⁰⁰	7.145 ²⁴⁶	30.14 ¹⁶⁵	22.605 ²⁹⁵	57.76 ⁹⁸	9.267 ²⁴³	14.94 ²
Sept. 6.6	19.523 ²⁰¹	68.11 ⁷⁴	7.391 ²¹⁵	31.79 ¹⁵⁵	22.900 ²⁵²	58.74 ¹⁴⁷	9.510 ²¹²	14.92 ⁴⁰
16.6	19.724 ¹⁷⁰	68.85 ⁴⁹	7.606 ¹⁸⁵	33.34 ¹⁴⁰	23.152 ²⁰⁴	60.21 ¹⁸⁹	9.722 ¹⁷⁷	15.32 ⁷⁸
26.6	19.894 ¹³⁹	69.34 ²³	7.791 ¹⁵¹	34.74 ¹²³	23.356 ¹⁵³	62.10 ²²⁶	9.899 ¹⁴³	16.10 ¹¹²
Oct. 6.5	20.033 ¹⁰⁷	69.57 ¹	7.942 ¹¹⁸	35.97 ⁸⁸	23.509 ¹⁰⁰	64.36 ²⁵³	10.042 ¹⁰⁷	17.22 ¹³⁹
16.5	20.140 ⁷⁶	69.58 ²⁰	8.060 ⁸⁷	37.03 ⁸⁸	23.609 ⁴⁸	66.89 ²⁷⁰	10.149 ⁷¹	18.61 ¹⁶⁰
26.5	20.216 ⁴⁸	69.38 ³⁸	8.147 ⁵⁶	37.91 ⁶⁹	23.657 ⁵	69.59 ²⁷⁶	10.220 ³⁷	20.21 ¹⁷⁵
Nov. 5.5	20.264 ¹⁸	69.00 ⁵¹	8.203 ²⁶	38.60 ⁵²	23.652 ⁹¹	72.35 ²⁷¹	10.257 ⁶	21.96 ¹⁸²
15.4	20.282 ⁸	68.49 ⁶²	8.229 ³	39.12 ³⁵	23.601 ⁵⁵	75.06 ²⁵⁵	10.263 ²⁶	23.78 ¹⁸⁰
25.4	20.274 ³⁵	67.87 ⁶⁹	8.226 ³²	39.47 ¹⁶	23.506 ¹³⁶	77.61 ²³¹	10.237 ⁵⁴	25.53 ¹⁷²
Dec. 5.4	20.239 ⁵⁷	67.18 ⁷⁴	8.194 ⁵⁸	39.63 ¹	23.370 ¹⁷¹	79.92 ¹⁹⁶	10.183 ⁸¹	27.30 ¹⁵⁶
15.3	20.182 ⁸¹	66.44 ⁷⁵	8.136 ⁸³	39.62 ¹⁸	23.199 ²⁰⁰	81.88 ¹⁵⁵	10.102 ¹⁰²	28.86 ¹²⁶
25.3	20.101 ⁹⁸	65.69 ⁷⁴	8.053 ¹⁰⁵	39.44 ³⁴	22.999 ²²¹	83.43 ¹¹⁰	10.000 ¹²³	30.22 ¹¹¹
35.3	20.003	64.95	7.948	39.10	22.778	84.53	9.877	31.33
Mean Place	15.422	41.75	3.057	10.04	19.001	92.87	5.618	46.13
Sec δ , Tan δ	1.001	+0.049	1.067	+0.372	1.458	-1.062	1.075	-0.393
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.07	-0.02	+0.05	+0.06	+0.06	+0.02
$D\psi\delta$, $D\omega\delta$	+0.4	+0.5	+0.4	+0.5	+0.4	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Hydri. Mag. 3.0		50 Cassiopeiæ. Mag. 4.1		γ Andromedæ pr. Mag. 2.3		α Arietis. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 56	° ' " -61 57	h m 1 56	° ' " +72 1	h m 1 58	° ' " +41 55	h m 2 2	° ' " +23 4
	s	"	s	"	s	"	s	"
Jan. 0.3	10.74	94.94	21.69	38.40	49.563	74.24	31.005	27.18
10.3	10.35	95.59	21.17	39.32	49.404	74.37	30.892	26.85
20.3	9.94	95.65	20.60	39.66	49.225	74.13	30.762	26.36
30.2	9.53	95.13	20.01	39.42	49.033	73.54	30.621	25.71
Feb. 9.2	9.13	94.05	19.43	38.60	48.837	72.62	30.476	24.93
19.2	8.76	92.44	18.88	37.24	48.648	71.40	30.333	24.05
Mar. 1.1	8.42	90.35	18.38	35.40	48.478	69.95	30.203	23.10
11.1	8.12	87.83	17.98	33.17	48.337	68.32	30.096	22.14
21.1	7.87	84.94	17.67	30.63	48.236	66.59	30.019	21.21
31.1	7.70	81.75	17.48	27.91	48.184	64.84	29.979	20.36
Apr. 10.0	7.59	78.33	17.41	25.10	48.187	63.15	29.982	19.66
20.0	7.55	74.74	17.50	22.32	48.247	61.58	30.032	19.14
30.0	7.60	71.09	17.72	19.68	48.367	60.22	30.131	18.85
May 10.0	7.74	67.43	18.06	17.27	48.547	59.13	30.279	18.80
19.9	7.95	63.86	18.54	15.18	48.782	58.36	30.474	19.03
29.9	8.23	60.45	19.12	13.47	49.066	57.91	30.709	19.52
June 8.9	8.58	57.29	19.79	12.19	49.392	57.83	30.981	20.29
18.8	8.98	54.44	20.53	11.39	49.752	58.12	31.282	21.31
28.8	9.44	51.99	21.33	11.08	50.135	58.76	31.603	22.56
July 8.8	9.93	49.99	22.15	11.27	50.532	59.74	31.937	23.99
18.8	10.44	48.51	22.99	11.96	50.934	61.04	32.276	25.59
28.7	10.96	47.59	23.83	13.12	51.330	62.62	32.611	27.29
Aug. 7.7	11.47	47.24	24.64	14.73	51.715	64.43	32.936	29.05
17.7	11.96	47.48	25.41	16.75	52.079	66.43	33.244	30.83
27.7	12.42	48.31	26.13	19.13	52.417	68.59	33.530	32.59
Sept. 6.6	12.82	49.70	26.78	21.84	52.723	70.84	33.789	34.28
16.6	13.17	51.61	27.35	24.81	52.994	73.14	34.020	35.87
26.6	13.44	53.94	27.83	27.98	53.229	75.45	34.220	37.35
Oct. 6.5	13.64	56.65	28.23	31.28	53.424	77.74	34.387	38.69
16.5	13.76	59.60	28.54	34.66	53.580	79.95	34.522	39.86
26.5	13.81	62.70	28.74	38.05	53.696	82.04	34.625	40.87
Nov. 5.5	13.77	65.82	28.82	41.36	53.771	84.00	34.696	41.72
15.4	13.65	68.83	28.81	44.52	53.807	85.78	31.736	42.38
25.4	13.46	71.64	28.68	47.44	53.804	87.32	34.744	42.88
Dec. 5.4	13.21	74.11	28.46	50.06	53.761	88.60	34.723	43.19
15.4	12.91	76.17	28.14	52.28	53.681	89.60	34.674	43.32
25.3	12.56	77.74	27.72	54.05	53.566	90.27	34.596	43.28
35.3	12.18	78.76	27.24	55.30	53.422	90.60	34.495	43.04
Mean Place	8.844	84.38	19.026	13.50	47.863	55.46	29.429	13.99
Sec δ , Tan δ	2.128	-1.879	3.240	+3.082	1.344	+0.898	1.087	+0.426
D ϕ α , D ω α	+0.04	+0.11	+0.10	-0.18	+0.07	-0.05	+0.07	-0.02
D ϕ δ , D ω δ	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Trianguli. Mag. 3.1		55 Cassiopeiae. Mag. 6.2		6 Persei. Mag. 5.4		ξ^1 Ceti. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 4	° ' " +34 35	h m 2 7	° ' " +66 8	h m 2 8	° ' " +50 40	h m 2 8	° ' " + 8 27
Jan. 0.3	37.638	59.59	59.43	33.94	6.488	71.92	37.464	36.46
10.3	37.506 ¹³²	59.57 ²	59.07 ³⁶	34.83 ⁸⁹	6.294 ¹⁹⁴	72.37 ⁴⁵	37.364 ¹⁰⁰	35.85 ⁶¹
20.3	37.353 ¹⁵³	59.26 ³¹	58.67 ⁴⁰	35.18 ³⁵	6.072 ²²²	72.39 ²	37.245 ¹¹⁹	35.23 ⁶²
30.2	37.186 ¹⁶⁷	58.66 ⁶⁰	58.24 ⁴³	34.99 ¹⁹	5.832 ²⁴⁰	71.97 ⁴²	37.116 ¹²⁹	34.61 ⁶²
Feb. 9.2	37.015 ¹⁷¹	57.82 ⁸⁴	57.81 ⁴³	34.26 ⁷³	5.588 ²⁴⁴	71.13 ⁸⁴	36.982 ¹³⁴	34.03 ⁵⁸
19.2	36.849 ¹⁶⁶	56.75 ¹⁰⁷	57.40 ⁴¹	33.02 ¹²⁴	5.351 ²³⁷	69.92 ¹²¹	36.850 ¹³²	33.49 ⁵⁴
Mar. 1.1	36.697 ¹⁵²	55.49 ¹²⁶	57.02 ³⁸	31.33 ¹⁶⁹	5.135 ²¹⁶	68.38 ¹⁵⁴	36.729 ¹²¹	33.03 ⁴⁶
11.1	36.570 ¹²⁷	54.13 ¹³⁶	56.70 ³²	29.25 ²⁰⁸	4.953 ¹⁸²	66.60 ¹⁷⁸	36.625 ¹⁰⁴	32.68 ³⁵
21.1	36.478 ⁹²	52.71 ¹⁴²	56.47 ²³	26.91 ²³⁴	4.816 ¹³⁷	64.62 ¹⁹⁸	36.548 ⁷⁷	32.47 ²¹
31.1	36.428 ⁵⁰	51.30 ¹⁴¹	56.31 ¹⁶	24.36 ²⁵⁵	4.735 ⁸¹	62.55 ²⁰⁷	36.503 ⁴⁵	32.41 ⁶
Apr. 10.0	36.426 ²	49.98 ¹³²	56.25 ⁶	21.73 ²⁶³	4.717 ¹⁸	60.47 ²⁰⁸	36.498 ⁵	32.56 ¹⁵
20.0	36.478 ⁵²	48.81 ¹¹⁷	56.30 ⁵	19.14 ²⁶⁹	4.768 ⁵¹	58.48 ¹⁹⁹	36.536 ³⁸	32.90 ³⁴
30.0	36.584 ¹⁰⁶	47.84 ⁹⁷	56.45 ¹⁵	16.67 ²⁴⁷	4.888 ¹²⁰	56.65 ¹⁸³	36.620 ⁸⁴	33.47 ⁵⁷
May 10.0	36.744 ¹⁶⁰	47.13 ⁷¹	56.72 ²⁷	14.41 ²²⁶	5.078 ¹⁹⁰	55.08 ¹⁵⁷	36.749 ¹²⁹	34.28 ⁸¹
19.9	36.955 ²¹¹	46.70 ⁴³	57.07 ³⁵	12.45 ¹⁹⁶	5.331 ²⁶³	53.79 ¹²⁹	36.921 ¹⁷²	35.30 ¹⁰²
29.9	37.213 ²⁵⁸	46.59 ¹¹	57.52 ⁴⁵	10.85 ¹⁶⁰	5.644 ³¹³	52.85 ⁹⁴	37.133 ²¹²	36.54 ¹²⁴
June 8.9	37.510 ²⁹⁷	46.81 ²²	58.04 ⁵²	9.66 ¹¹⁹	6.007 ³⁶³	52.30 ⁵⁵	37.380 ²⁴⁷	37.95 ¹⁴¹
18.8	37.838 ³²⁸	47.34 ⁵³	58.61 ⁵⁷	8.92 ⁷⁴	6.409 ⁴⁰²	52.13 ¹⁷	37.655 ²⁷⁵	39.51 ¹⁵⁶
28.8	38.190 ³⁵²	48.19 ⁸⁵	59.23 ⁶²	8.64 ²⁸	6.841 ⁴³²	52.38 ²⁵	37.953 ²⁹⁸	41.20 ¹⁶⁹
July 8.8	38.555 ³⁶⁵	49.32 ¹¹³	59.89 ⁶⁶	8.83 ¹⁹	7.292 ⁴⁶¹	53.01 ⁶³	38.263 ³¹⁰	42.94 ¹⁷⁴
18.8	38.926 ³⁷¹	50.70 ¹³⁸	60.55 ⁶⁶	9.49 ⁶⁶	7.751 ⁴⁵⁹	54.02 ¹⁰¹	38.579 ³¹⁶	44.70 ¹⁷⁶
28.7	39.293 ³⁶⁷	52.30 ¹⁶⁰	61.21 ⁶⁶	10.59 ¹¹⁰	8.207 ⁴⁵⁶	55.36 ¹³⁴	38.893 ³¹⁴	46.42 ¹⁷²
Aug. 7.7	39.649 ³⁵⁶	54.06 ¹⁷⁶	61.86 ⁶⁵	12.12 ¹⁵³	8.649 ⁴⁴²	57.03 ¹⁶⁷	39.198 ³⁰⁵	48.06 ¹⁶⁴
17.7	39.988 ³³⁹	55.95 ¹⁸⁹	62.48 ⁶²	14.02 ¹⁹⁰	9.073 ⁴²⁴	58.97 ¹⁹⁴	39.490 ²⁹²	49.59 ¹⁵³
27.7	40.303 ³¹⁵	57.93 ¹⁹⁸	63.06 ⁵⁸	16.26 ²²⁴	9.468 ³⁵⁵	61.14 ²¹⁷	39.762 ²⁷²	50.96 ¹³⁷
Sept. 6.6	40.590 ²⁸⁷	59.95 ²⁰²	63.60 ⁵⁴	18.80 ²⁵⁴	9.830 ³⁶²	63.47 ²⁸³	40.008 ²⁴⁶	52.13 ¹¹⁷
16.6	40.845 ²⁵⁵	61.98 ²⁰⁸	64.07 ⁴⁷	21.58 ²⁷⁸	10.152 ³²²	65.94 ²⁴⁷	40.227 ²¹⁹	53.10 ⁹⁷
26.6	41.067 ²²²	63.96 ¹⁹⁶	64.48 ⁴¹	24.54 ²⁹⁶	10.435 ²⁸³	68.51 ²⁵⁷	40.418 ¹⁹¹	53.84 ⁷⁴
Oct. 6.5	41.255 ¹⁸⁸	65.87 ¹⁹¹	64.83 ³⁵	27.64 ³¹⁰	10.672 ²³⁷	71.09 ²⁵⁸	40.578 ¹⁶⁰	54.37 ⁵³
16.5	41.406 ¹⁵¹	67.69 ¹⁸²	65.10 ²⁷	30.79 ³¹⁵	10.864 ¹⁹²	73.66 ²⁶⁷	40.708 ¹³⁰	54.67 ³⁰
26.5	41.521 ¹¹⁵	69.37 ¹⁶⁸	65.29 ¹⁹	33.94 ³¹⁵	11.009 ¹⁴⁵	76.17 ²⁵¹	40.806 ⁹⁸	54.78 ¹¹
Nov. 5.5	41.601 ⁸⁰	70.90 ¹⁵³	65.41 ¹²	37.02 ³⁰⁸	11.106 ⁹⁷	78.57 ²⁴⁰	40.875 ⁶⁹	54.72 ⁶
15.4	41.646 ⁴⁵	72.26 ¹³⁶	65.45 ⁴	39.97 ²⁹⁵	11.154 ⁴⁸	80.81 ²²⁴	40.915 ⁴⁰	54.49 ²³
25.4	41.654 ⁸	73.41 ¹¹⁵	65.41 ⁴	42.72 ²⁷⁵	11.153 ¹	82.81 ²⁰⁰	40.925 ¹⁰	54.14 ³⁵
Dec. 5.4	41.627 ²⁷	74.35 ⁹⁴	65.28 ¹³	45.17 ²⁴⁵	11.104 ⁴⁹	84.56 ¹⁷⁵	40.908 ¹⁷	53.70 ⁴⁴
15.4	41.567 ⁶⁰	75.02 ⁶⁷	65.07 ²¹	47.26 ²⁰⁹	11.010 ⁹⁴	86.01 ¹⁴⁵	40.865 ⁴³	53.18 ⁵²
25.3	41.476 ⁹¹	75.44 ⁴²	64.80 ²⁷	48.94 ¹⁶⁸	10.871 ¹³⁹	87.06 ¹⁰⁷	40.796 ⁶⁹	52.60 ⁵⁸
35.3	41.355 ¹²¹	75.57 ¹³	64.47 ³³	50.13 ¹¹⁹	10.694 ¹⁷⁷	87.76 ⁶⁸	40.706 ⁹⁰	51.98 ⁶²
Mean Place	35.965	42.98	56.952	10.27	4.556	51.26	35.910	28.09
Sec δ , Tan δ	1.215	+0.690	2.472	+2.261	1.578	+1.221	1.011	+0.149
$D\phi$ α , $D\phi$ δ	+0.07	-0.04	+0.09	-0.13	+0.08	-0.07	+0.06	-0.01
$D\phi$ δ , $D\phi$ δ	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5	+0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Fornacis. Mag. 5.2			γ Trianguli. Mag. 4.1			67 Ceti. Mag. 5.7			ϕ Eridani. Mag. 3.8		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	2 9		-31 6	2 12		+33 27	2 12		- 6 47	2 13		-51 53
Jan. 0.3	16.491		50.96	24.214		66.32	52.088		71.66	34.352		54.43
10.3	16.338	153	51.99	24.087	127	66.32	51.983	106	72.54	34.086	266	55.44
20.3	16.169	169	52.63	23.940	147	66.04	51.861	122	73.25	33.803	283	55.90
30.2	15.992	177	52.87	23.776	164	65.50	51.728	123	73.80	33.510	293	55.83
Feb. 9.2	15.811	181	52.70	23.606	170	64.71	51.589	129	74.15	33.218	292	55.22
	176		58	166		100	137		14	283		113
19.2	15.635		52.12	23.440		63.71	51.452		74.29	32.935		54.09
Mar. 1.2	15.473	162	51.16	23.285	155	62.53	51.324	128	74.23	32.673	262	52.48
11.1	15.331	142	49.82	23.155	130	61.25	51.215	109	73.93	32.440	233	50.43
21.1	15.219	112	48.14	23.055	100	59.91	51.129	86	73.41	32.247	193	47.97
31.1	15.142	77	46.13	22.998	57	58.57	51.076	53	72.64	32.101	146	45.19
	35		228	10		125	15		100	91		307
Apr. 10.0	15.107		43.85	22.988		57.32	51.061		71.64	32.010		42.12
20.0	15.116	9	41.33	23.030	42	56.21	51.088	27	70.40	31.977	33	38.85
30.0	15.175	59	38.62	23.127	97	55.28	51.159	71	68.94	32.007	30	35.43
May 10.0	15.283	108	35.79	23.276	149	54.61	51.275	116	67.27	32.103	96	31.95
19.9	15.440	157	32.88	23.478	202	54.20	51.434	159	65.44	32.261	158	28.48
	201		292	247		10	199		196	218		339
29.9	15.641		29.96	23.725		54.10	51.633		63.48	32.479		25.09
June 8.9	15.883	242	27.11	24.011	286	54.32	51.867	224	61.42	32.752	273	21.88
18.9	16.159	276	24.38	24.332	321	54.83	52.132	265	59.32	33.073	321	18.91
28.8	16.461	302	21.86	24.678	346	55.66	52.418	286	57.23	33.435	362	16.26
July 8.8	16.782	321	19.61	25.037	359	56.74	52.720	302	55.21	33.825	390	14.02
	332		192	366		132	300		189	409		181
18.8	17.114		17.69	25.403		58.06	53.029		53.32	34.234		12.21
28.7	17.449	335	16.15	25.768	365	59.60	53.338	309	51.61	34.652	418	10.92
Aug. 7.7	17.777	328	15.04	26.122	354	61.31	53.639	301	50.11	35.067	415	10.18
17.7	18.090	313	14.39	26.460	338	63.12	53.927	288	48.89	35.468	401	10.00
27.7	18.383	293	14.22	26.777	317	65.03	54.196	269	47.96	35.842	374	10.40
	265		30	290		193	245		61	340		96
Sept. 6.6	18.648		14.52	27.067		66.96	54.441		47.35	36.182		11.36
16.6	18.881	233	15.29	27.327	260	68.89	54.659	218	47.07	36.481	299	12.84
26.6	19.078	197	16.48	27.554	227	70.78	54.848	189	47.10	36.730	249	14.81
Oct. 6.6	19.238	160	18.04	27.747	193	72.61	55.006	158	47.44	36.925	195	17.15
16.5	19.358	120	19.91	27.906	159	74.33	55.132	126	48.04	37.062	137	19.83
	81		211	123		159	96		82	77		268
26.5	19.439		22.02	28.029		75.92	55.228		48.86	37.139		22.71
Nov. 5.5	19.481	42	24.26	28.118	89	77.37	55.293	65	49.85	37.160	21	25.67
15.4	19.486	5	26.54	28.170	52	78.66	55.327	34	50.97	37.122	38	28.63
25.4	19.455	31	28.79	28.188	18	79.75	55.333	6	52.17	37.031	91	31.45
Dec. 5.4	19.391	64	30.89	28.170	18	80.64	55.310	23	53.37	36.892	139	34.02
	93		190	51		64	48		118	185		224
15.4	19.298		32.79	28.119		81.28	55.262		54.53	36.707		36.26
25.3	19.177	121	34.40	28.036	83	81.69	55.188	74	55.62	36.484	223	38.07
35.3	19.033	144	35.68	27.922	114	81.83	55.092	96	56.60	36.231	253	39.42
Mean Place	14.907		47.04	22.490		50.23	50.533		75.03	32.555		45.88
Sec δ , Tan δ	1.168		-0.604	1.199		+0.661	1.007		-0.119	1.620		-1.275
$D\phi a$, $D_\omega a$	+0.05		+0.03	+0.07		-0.04	+0.06		+0.01	+0.04		+0.07
$D\phi \delta$, $D_\omega \delta$	+0.3		+0.5	+0.3		+0.5	+0.3		+0.5	+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o Ceti. (Mira.) Var. 1.7-9.6		κ Fornacis. Mag. 5.4		δ Hydri. Mag. 4.3		ι Cassiopeiae. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 15	° ' " - 3 20	h m 2 18	° ' " -24 11	h m 2 20	° ' " -69 1	h m 2 22	° ' " +67 1
	s "	s "	s "	s "	s "	s "	s "	s "
Jan. 0.3	10.717	69.37	46.250	37.21	18.41	83.20	15.31	71.72
10.3	10.616	70.20	46.119	38.29	17.86	84.09	14.94	72.79
20.3	10.496	70.91	45.971	39.05	17.29	84.37	14.53	73.34
30.2	10.366	71.49	45.811	39.46	16.70	84.06	14.09	73.33
Feb. 9.2	10.229	71.90	45.646	39.51	16.12	83.15	13.64	72.79
19.2	10.093	72.14	45.484	39.21	15.56	81.69	13.20	71.72
Mar. 1.2	9.966	72.21	45.331	38.54	15.04	79.72	12.79	70.18
11.1	9.856	72.06	45.197	37.54	14.58	77.29	12.44	68.24
21.1	9.772	71.71	45.088	36.21	14.17	74.48	12.17	65.99
31.1	9.719	71.14	45.013	34.57	13.85	71.32	11.97	63.51
Apr. 10.0	9.703	70.33	44.977	32.66	13.61	67.92	11.88	60.90
20.0	9.729	69.31	44.984	30.50	13.47	64.32	11.89	58.29
30.0	9.800	68.05	45.037	28.13	13.44	60.63	12.02	55.76
May 10.0	9.915	66.59	45.138	25.60	13.51	56.92	12.25	53.41
19.9	10.073	64.94	45.285	22.97	13.68	53.27	12.59	51.32
29.9	10.272	63.16	45.475	20.28	13.95	49.77	13.02	49.57
June 8.9	10.505	61.25	45.704	17.61	14.31	46.49	13.53	48.19
18.9	10.769	59.27	45.968	15.02	14.75	43.52	14.11	47.25
28.8	11.054	57.28	46.257	12.56	15.28	40.94	14.74	46.76
July 8.8	11.356	55.33	46.566	10.32	15.85	38.80	15.41	46.74
18.8	11.664	53.46	46.885	8.35	16.47	37.17	16.09	47.18
28.7	11.973	51.74	47.206	6.70	17.10	36.10	16.78	48.07
Aug. 7.7	12.274	50.22	47.522	5.42	17.75	35.63	17.46	49.38
17.7	12.563	48.93	47.826	4.56	18.38	35.76	18.12	51.09
27.7	12.833	47.90	48.111	4.12	18.97	36.47	18.74	53.16
Sept. 6.6	13.079	47.17	48.372	4.13	19.52	37.79	19.31	55.53
16.6	13.300	46.72	48.604	4.58	19.99	39.64	19.83	58.18
26.6	13.490	46.59	48.804	5.44	20.38	41.98	20.29	61.02
Oct. 6.6	13.651	46.74	48.969	6.66	20.68	44.72	20.68	64.04
16.5	13.782	47.14	49.099	8.21	20.88	47.75	21.00	67.14
26.5	13.880	47.77	49.193	9.98	20.97	50.96	21.24	70.27
Nov. 5.5	13.948	48.58	49.252	11.93	20.94	54.23	21.39	73.35
15.4	13.988	49.51	49.276	13.96	20.82	57.43	21.47	76.35
25.4	13.997	50.53	49.267	15.98	20.59	60.44	21.46	79.17
Dec. 5.4	13.979	51.58	49.227	17.92	20.27	63.14	21.36	81.71
15.4	13.935	52.63	49.156	19.72	19.87	65.44	21.18	83.93
25.3	13.865	53.63	49.059	21.28	19.39	67.26	20.92	85.76
35.3	13.772	54.54	48.937	22.56	18.87	68.53	20.58	87.12
Mean Place	9.150	73.83	44.646	35.30	14.017	72.48	12.509	48.50
Sec δ, Tan δ	1.002	-0.058	1.096	-0.449	2.795	-2.610	2.563	+2.360
D _α α, D _α α	+0.06	0.00	+0.05	+0.02	+0.02	+0.14	+0.10	-0.13
D _δ δ, D _δ δ	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^3 Ceti. Mag. 4.3		σ Ceti. Mag. 4.8		36 H. Cassiopeiae. Mag. 5.3		γ Ceti. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 23	° ' " + 8 5	h m 2 28	° ' " -15 36	h m 2 30	° ' " +72 27	h m 2 31	° ' " + 5 13
Jan. 0.3	46.258	27.28	10.749	28.80	10.16	46.29	32.640	61.40
10.3	46.163 ⁹⁵	26.66 ⁶²	10.636 ¹¹³	29.86 ¹⁰⁶	9.70 ⁴⁶	47.62 ¹³³	32.547 ⁹³	60.75 ⁶⁵
20.3	46.047 ¹¹⁶	26.05 ⁶¹	10.506 ¹³⁹	30.67 ⁸¹	9.13 ⁵⁷	48.40 ⁷⁸	32.433 ¹¹⁴	60.10 ⁶⁵
30.2	45.917 ¹³⁰	25.45 ⁶⁰	10.362 ¹⁴⁴	31.22 ⁵⁵	8.53 ⁶⁰	48.60 ²⁰	32.304 ¹²⁹	59.50 ⁶⁰
Feb. 9.2	45.779 ¹³⁸	24.88 ⁵⁷	10.210 ¹⁵²	31.48 ²⁶	7.92 ⁶¹	48.22 ³⁸	32.166 ¹³⁸	58.97 ⁵³
19.2	45.641 ¹³⁸	24.37 ⁵¹	10.057 ¹⁵³	31.46 ²	7.32 ⁶⁰	47.28 ⁹⁴	32.025 ¹⁴¹	58.52 ⁴⁵
Mar. 1.2	45.510 ¹³¹	23.94 ⁴³	9.912 ¹⁴⁵	31.14 ³²	6.76 ⁵⁶	45.83 ¹⁴⁵	31.891 ¹³⁴	58.17 ³⁵
11.1	45.396 ¹¹⁴	23.60 ²⁴	9.783 ¹²⁹	30.52 ⁶²	6.26 ⁵⁰	43.92 ¹⁹¹	31.773 ¹¹⁸	57.97 ²⁰
21.1	45.306 ⁹⁰	23.41 ¹⁹	9.678 ¹⁰⁶	29.63 ⁸⁹	5.86 ⁴⁰	41.64 ²²⁸	31.677 ⁹⁶	57.90 ⁷
31.1	45.249 ⁵⁷	23.37 ⁴	9.604 ⁷⁴	28.45 ¹¹⁸	5.57 ²⁹	39.08 ²⁵⁶	31.612 ⁶⁵	58.01 ¹¹
Apr. 10.1	45.230 ¹⁹	23.52 ¹⁵	9.567 ³⁷	27.01 ¹⁴⁴	5.42 ¹⁵	36.37 ²⁷¹	31.585 ²⁷	58.31 ³⁰
20.0	45.253 ²³	23.87 ³⁵	9.572 ⁵	25.32 ¹⁶⁹	5.40 ²	33.60 ²⁷⁷	31.600 ¹⁵	58.81 ⁵⁰
30.0	45.322 ⁶⁹	24.43 ⁵⁶	9.621 ⁴⁹	23.41 ¹⁹¹	5.52 ¹²	30.88 ²⁷²	31.659 ⁵⁹	59.53 ⁷³
May 10.0	45.437 ¹¹⁵	25.22 ⁷⁹	9.715 ⁹⁴	21.32 ²⁰⁹	5.77 ²⁵	28.31 ²⁶⁷	31.764 ¹⁰⁵	60.46 ⁹³
19.9	45.596 ¹⁵⁹	26.21 ⁹⁹	9.855 ¹⁴⁰	19.07 ²²⁵	6.17 ⁴⁰	25.97 ²³⁴	31.913 ¹⁴⁹	61.61 ¹¹⁵
29.9	45.796 ²⁰⁰	27.42 ¹²¹	10.038 ¹⁸³	16.73 ²³⁴	6.68 ⁵¹	23.95 ²⁰²	32.103 ¹⁹⁰	62.93 ¹³²
June 8.9	46.032 ²³⁶	28.80 ¹³⁸	10.258 ²²⁰	14.35 ²³⁸	7.30 ⁶²	22.31 ¹⁶⁴	32.330 ²²⁷	64.41 ¹⁴⁸
18.9	46.299 ²⁶⁷	30.33 ¹⁵³	10.511 ²⁵³	11.98 ²³⁷	8.01 ⁷¹	21.09 ¹²²	32.589 ²⁶⁹	66.04 ¹⁶³
28.8	46.588 ²⁸⁹	31.97 ¹⁶⁴	10.789 ²⁷⁸	9.68 ²³⁰	8.79 ⁷⁸	20.33 ⁷⁹	32.872 ²⁸³	67.75 ¹⁷¹
July 8.8	46.894 ³⁰⁶	33.67 ¹⁷⁰	11.085 ²⁹⁶	7.52 ²¹⁶	9.62 ⁸³	20.04 ²⁶	33.172 ³⁰⁰	69.48 ¹⁷³
18.8	47.207 ³¹³	35.38 ¹⁷¹	11.394 ³⁰⁹	5.55 ¹⁹⁷	10.48 ⁸⁶	20.23 ¹⁹	33.482 ⁸¹⁰	71.21 ¹⁷⁸
28.8	47.522 ³¹⁵	37.07 ¹⁶⁹	11.705 ³¹¹	3.83 ¹⁷²	11.35 ⁸⁷	20.89 ⁶⁶	33.794 ⁸¹²	72.88 ¹⁶⁷
Aug. 7.7	47.829 ³⁰⁷	38.66 ¹⁵⁹	12.011 ³⁰⁶	2.41 ¹⁴²	12.21 ⁸⁶	22.01 ¹¹²	34.100 ⁸⁰⁶	74.45 ¹⁵⁷
17.7	48.125 ²⁹⁶	40.13 ¹⁴⁷	12.308 ²⁹⁷	1.34 ¹⁰⁷	13.05 ⁸⁴	23.57 ¹⁵⁶	34.396 ²⁹⁶	75.87 ¹⁴²
27.7	48.403 ²⁷⁸	41.45 ¹³²	12.586 ²⁷⁸	0.63 ⁷¹	13.85 ⁸⁰	25.51 ¹⁹⁴	34.676 ²⁸⁰	77.09 ¹²²
Sept. 6.6	48.659 ²⁵⁶	42.57 ¹¹²	12.843 ²⁵⁷	0.31 ³²	14.58 ⁷⁸	27.80 ²²⁹	34.934 ²⁵⁸	78.11 ¹⁰²
16.6	48.890 ²³¹	43.48 ⁹¹	13.075 ²³²	0.39 ⁸	15.26 ⁶⁸	30.41 ²⁶¹	35.168 ²³⁴	78.88 ⁷⁷
26.6	49.092 ²⁰²	44.16 ⁶⁸	13.277 ²⁰²	0.83 ⁴⁴	15.87 ⁶¹	33.27 ²⁸⁶	35.375 ²⁰⁷	79.42 ⁵⁴
Oct. 6.6	49.266 ¹⁷⁴	44.63 ⁴⁷	13.448 ¹⁷¹	1.63 ⁸⁰	16.39 ⁵²	36.33 ³⁰⁶	35.555 ¹⁸⁰	79.71 ²⁹
16.5	49.411 ¹⁴⁵	44.88 ²⁵	13.588 ¹⁴⁰	2.73 ¹¹⁰	16.81 ⁴²	39.52 ³¹⁹	35.704 ¹⁴⁹	79.78 ⁷
26.5	49.525 ¹¹⁴	44.93 ⁵	13.694 ¹⁰⁶	4.06 ¹³³	17.12 ⁸¹	42.79 ³²⁷	35.824 ¹²⁰	79.64 ¹⁴
Nov. 5.5	49.609 ⁸⁴	44.81 ¹²	13.767 ⁷³	5.59 ¹⁵³	17.34 ²²	46.06 ³²⁷	35.915 ⁹¹	79.32 ³²
15.5	49.665 ⁵⁶	44.53 ²⁸	13.810 ⁴³	7.24 ¹⁶⁵	17.44 ¹⁰	49.26 ³²⁰	35.975 ⁶⁰	78.86 ⁴⁶
25.4	49.690 ²⁵	44.14 ³⁹	13.820 ¹⁰	8.92 ¹⁶⁸	17.43 ¹	52.30 ³⁰⁴	36.005 ³⁰	78.28 ⁵⁸
Dec. 5.4	49.687 ³	43.66 ⁴⁸	13.800 ²⁰	10.57 ¹⁶⁵	17.30 ¹³	55.11 ²⁸¹	36.007 ²	77.63 ⁶⁵
15.4	49.654 ³³	43.11 ⁵⁵	13.751 ⁴⁹	12.13 ¹⁶⁶	17.05 ²⁵	57.59 ²⁴⁸	35.979 ²⁸	76.92 ⁷¹
25.3	49.595 ⁵⁹	42.51 ⁶⁰	13.674 ⁷⁷	13.55 ¹⁴²	16.71 ³⁴	59.68 ²⁰⁹	35.924 ⁵⁵	76.20 ⁷³
35.3	49.511 ⁸⁴	41.88 ⁶³	13.573 ¹⁰¹	14.77 ¹²²	16.27 ⁴⁴	61.31 ¹⁶³	35.843 ⁸¹	75.50 ⁷⁰
Mean Place	44.617	19.19	9.116	29.45	6.628	22.70	30.967	54.36
Sec δ , Tan δ	1.010	+0.142	1.038	-0.279	3.318	+3.164	1.004	+0.092
$D\psi a$, $D_\omega a$	+0.06	-0.01	+0.06	+0.01	+0.11	-0.17	+0.06	-0.01
$D\psi \delta$, $D_\omega \delta$	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Hydr. Mag. 5.3		γ Arietis. Mag. 5.4		δ Ceti. Mag. 4.0		ϵ Hydr. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 33	° ' " -79 27	h m 2 34	° ' " +21 36	h m 2 35	° ' " - 0 1	h m 2 38	° ' " -68 36
Jan. 0.3	27.66	89.07	7.785	23.37	15.287	38.35	21.00	90.86
10.3	26.49	89.96	7.686	23.12	15.193	39.16	20.48	92.02
20.3	25.24	90.25	7.564	22.74	15.078	39.87	19.92	92.58
30.3	23.98	89.93	7.425	22.23	14.948	40.48	19.33	92.54
Feb. 9.2	22.74	89.02	7.275	21.61	14.806	40.97	18.75	91.92
19.2	21.53	87.55	7.122	20.89	14.666	41.32	18.18	90.73
Mar. 1.2	20.40	85.56	6.976	20.11	14.529	41.50	17.64	89.01
11.1	19.36	83.13	6.848	19.30	14.407	41.52	17.14	86.81
21.1	18.44	80.31	6.744	18.52	14.307	41.35	16.70	84.18
31.1	17.69	77.14	6.675	17.81	14.238	40.98	16.34	81.20
Apr. 10.1	17.09	73.74	6.647	17.20	14.205	40.40	16.06	77.93
20.0	16.66	70.16	6.664	16.74	14.214	39.59	15.88	74.44
30.0	16.44	66.48	6.729	16.48	14.267	38.57	15.80	70.81
May 10.0	16.41	62.79	6.844	16.42	14.365	37.33	15.82	67.13
19.9	16.57	59.16	7.007	16.61	14.508	35.91	15.93	63.46
29.9	16.93	55.69	7.214	17.04	14.691	34.31	16.16	59.91
June 8.9	17.46	52.44	7.460	17.71	14.912	32.59	16.48	56.53
18.9	18.17	49.50	7.738	18.60	15.165	30.77	16.88	53.45
28.8	19.03	46.95	8.042	19.71	15.442	28.90	17.36	50.71
July 8.8	20.01	44.85	8.365	20.98	15.737	27.04	17.90	48.39
18.8	21.08	43.26	8.696	22.39	16.043	25.23	18.48	46.57
28.8	22.22	42.22	9.029	23.90	16.352	23.54	19.10	45.28
Aug. 7.7	23.39	41.79	9.358	25.46	16.655	22.00	19.73	44.57
17.7	24.55	41.95	9.675	27.03	16.950	20.66	20.36	44.47
27.7	25.67	42.72	9.974	28.57	17.229	19.56	20.96	45.00
Sept. 6.6	26.70	44.08	10.252	30.05	17.486	18.71	21.52	46.12
16.6	27.61	45.99	10.505	31.44	17.721	18.15	22.02	47.81
26.6	28.37	48.37	10.732	32.70	17.928	17.88	22.44	50.00
Oct. 6.6	28.96	51.15	10.928	33.84	18.109	17.87	22.78	52.64
16.5	29.34	54.24	11.095	34.83	18.259	18.11	23.01	55.60
26.5	29.51	57.49	11.232	35.66	18.379	18.57	23.15	58.79
Nov. 5.5	29.45	60.80	11.336	36.34	18.471	19.22	23.18	62.10
15.5	29.17	64.05	11.410	36.88	18.532	20.00	23.11	65.38
25.4	28.68	67.10	11.450	37.28	18.563	20.88	22.93	68.51
Dec. 5.4	28.00	69.84	11.460	37.53	18.565	21.82	22.64	71.39
15.4	27.14	72.17	11.437	37.64	18.537	22.77	22.28	73.89
25.3	26.12	74.00	11.382	37.61	18.482	23.69	21.85	75.94
35.3	25.01	75.29	11.298	37.42	18.400	24.56	21.35	77.46
Mean Place	23.719	78.11	6.008	11.29	13.607	43.75	18.462	80.74
Sec δ , Tan δ	5.470	-5.879	1.076	+0.396	1.000	0.000	2.744	-2.555
$D\mu \alpha$, $D\mu \delta$	-0.03	+0.28	+0.07	-0.02	+0.06	0.00	+0.02	+0.13
$D\delta \delta$, $D\mu \delta$	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6	+0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Persei. Mag. 4.2			γ Ceti seq. Mag. 3.7			π Ceti. Mag. 4.4			μ Ceti. Mag. 4.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	2 38		+48 52	2 38		+ 2 53	2 40		-14 12	2 40		+ 9 45
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.3	33.574		60.90	61.581		18.20	11.960		33.41	28.894		60.45
10.3	33.410	164	61.56	61.490	91	17.46	11.855	105	34.51	28.806	88	59.88
20.3	33.213	197	61.82	61.377	113	16.78	11.727	128	35.38	28.694	112	59.30
30.3	32.989	224	61.69	61.247	130	16.17	11.584	143	35.99	28.565	129	58.72
Feb. 9.2	32.752	237	61.16	61.108	139	15.65	11.432	152	36.33	28.424	141	58.16
	239		90	143		42	155		7	144		52
19.2	32.513		60.26	60.965		15.23	11.277		36.40	28.280		57.64
Mar. 1.2	32.285	228	59.02	60.827	138	14.97	11.127	150	36.17	28.141	139	57.17
11.1	32.083	202	57.50	60.703	124	14.83	10.990	137	35.67	28.017	124	56.79
21.1	31.920	163	55.77	60.601	102	14.86	10.877	112	34.87	27.914	103	56.53
31.1	31.805	115	53.90	60.529	72	15.08	10.794	83	33.80	27.843	71	56.40
	87		192	35		41	48		133	34		3
Apr. 10.1	31.748		51.98	60.494		15.49	10.746		32.47	27.809		56.43
20.0	31.758	10	50.09	60.500	6	16.12	10.740	6	30.89	27.817	8	56.66
30.0	31.833	75	48.31	60.550	50	16.96	10.778	38	29.09	27.871	54	57.09
May 10.0	31.977	144	46.71	60.646	96	18.01	10.862	84	27.09	27.972	101	57.74
20.0	32.186	209	45.35	60.786	140	19.25	10.992	120	24.92	28.118	146	58.59
	269		106	183		143	172		226	187		105
29.9	32.455		44.29	60.969		20.68	11.164		22.66	28.305		59.64
June 8.9	32.777	322	43.56	61.189	220	22.25	11.375	211	20.33	28.531	226	60.89
18.9	33.145	368	43.18	61.441	252	23.95	11.620	245	18.00	28.789	258	62.28
28.8	33.547	402	43.16	61.718	277	25.70	11.891	271	15.72	29.072	283	63.79
July 8.8	33.973	426	43.50	62.013	295	27.48	12.182	291	13.56	29.375	303	65.38
	440		70	307		174	305		198	312		162
18.8	34.413		44.20	62.320		29.22	12.487		11.58	29.687		67.00
28.8	34.859	446	45.23	62.629	309	30.89	12.795	308	9.84	30.002	315	68.60
Aug. 7.7	35.300	441	46.55	62.934	305	32.43	13.101	306	8.37	30.314	312	70.15
17.7	35.728	428	48.14	63.230	296	33.80	13.399	298	7.24	30.615	301	71.59
27.7	36.134	406	49.95	63.511	281	34.95	13.682	283	6.47	30.902	287	72.89
	381		200	260		93	262		39	267		112
Sept. 6.7	36.515		51.95	63.771		35.88	13.944		6.08	31.169		74.01
16.6	36.864	349	54.10	64.009	238	36.55	14.183	239	6.07	31.413	244	74.94
26.6	37.177	313	56.35	64.220	211	36.95	14.394	211	6.44	31.631	218	75.65
Oct. 6.6	37.453	276	58.66	64.405	185	37.10	14.576	182	7.16	31.822	191	76.16
16.5	37.687	234	60.99	64.560	155	37.02	14.727	151	8.18	31.984	162	76.45
	190		231	125		32	119		129	133		11
26.5	37.877		63.30	64.685		36.70	14.846		9.47	32.117		76.56
Nov. 5.5	38.021	144	65.54	64.782	97	36.22	14.934	88	10.94	32.220	103	76.50
15.5	38.118	97	67.66	64.848	66	35.60	14.989	55	12.54	32.293	73	76.30
25.4	38.167	49	69.63	64.884	36	34.86	15.012	23	14.20	32.336	43	75.98
Dec. 5.4	38.165	2	71.40	64.891	7	34.07	15.005	7	15.83	32.348	12	75.56
	50		151	24		83	38		157	18		49
15.4	38.115		72.91	64.867		33.24	14.967		17.40	32.330		75.07
25.4	38.017	98	74.11	64.815	52	32.41	14.900	67	18.84	32.283	47	74.53
35.3	37.875	142	74.97	64.736	79	31.61	14.806	94	20.09	32.206	77	73.96
Mean Place	31.361		41.76	59.876		11.96	10.269		34.51	27.153		52.09
Sec δ , Tan δ	1.520		+1.146	1.001		+0.050	1.031		-0.253	1.015		+0.172
$D\psi a$, $D_{\infty} a$	+0.08		-0.06	+0.06		0.00	+0.06		+0.01	+0.06		-0.01
$D\psi \delta$, $D_{\infty} \delta$	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6	+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	77 Persei. Mag. 3.9		41 Arietis. Mag. 3.7		β Fornacis. Mag. 4.5		σ Arietis. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 44	° ' " +55 33	h m 2 45	° ' " +26 55	h m 2 45	° ' " -32 44	h m 2 46	° ' " +14 44
	s	"	s	"	s	"	s	"
Jan. 0.3	40.440	27.33	7.526	22.46	38.788	78.37	56.230	36.03
10.3	40.242 ¹⁹⁸	28.27 ⁹⁴	7.428 ⁹⁸	22.43 ³	38.640 ¹⁴⁸	79.75 ¹³⁸	56.144 ⁸⁶	35.61 ⁴²
20.3	40.001 ²⁴¹	28.76 ⁴⁹	7.303 ¹²⁵	22.20 ²³	38.469 ¹⁷¹	80.72 ⁹⁷	56.032 ¹¹²	35.13 ⁴⁸
30.3	39.729 ²⁷²	28.81 ⁵	7.157 ¹⁴⁶	21.79 ⁴¹	38.282 ¹⁸⁷	81.27 ⁵⁵	55.901 ¹³¹	34.60 ⁵³
Feb. 9.2	39.440 ²⁸⁹	28.41 ⁴⁰	6.997 ¹⁶⁰	21.22 ⁵⁷	38.085 ¹⁹⁷	81.38 ¹¹	55.757 ¹⁴⁴	34.04 ⁵⁶
	291	83	164	73	199	31	149	58
19.2	39.149	27.58	6.833	20.49	37.886	81.07	55.608	33.46
Mar. 1.2	38.870 ²⁷⁹	26.33 ¹²⁵	6.675 ¹⁵⁸	19.64 ⁸⁵	37.693 ¹⁹³	80.33 ⁷⁴	55.464 ¹⁴⁴	32.89 ⁵⁷
11.1	38.621 ²⁴⁹	24.75 ¹⁵⁸	6.532 ¹⁴³	18.71 ⁹³	37.516 ¹⁷⁷	79.19 ¹¹⁴	55.333 ¹³¹	32.35 ⁵⁴
21.1	38.415 ²⁰⁶	22.91 ¹⁸⁴	6.415 ¹¹⁷	17.75 ⁹⁶	37.365 ¹⁵¹	77.66 ¹⁵³	55.225 ¹⁰⁸	31.88 ⁴⁷
31.1	38.265 ¹⁵⁰	20.86 ²⁰⁵	6.333 ⁸²	16.80 ⁹⁵	37.246 ¹¹⁹	75.79 ¹⁸⁷	55.147 ⁷⁸	31.51 ³⁷
	82	216	41	88	80	219	40	23
Apr. 10.1	38.183	18.70	6.292 ⁷	15.92 ⁷⁶	37.166 ³³	73.60 ²⁴⁵	55.107 ³	31.28 ⁷
20.0	38.174 ⁹	16.53 ²¹⁷	6.299 ⁷	15.16 ⁷⁶	37.133 ³³	71.15 ²⁴⁵	55.110 ³	31.21 ⁷
30.0	38.242 ⁶⁸	14.45 ²⁰⁸	6.356 ⁵⁷	14.56 ⁶⁰	37.147 ¹⁴	68.47 ²⁶⁸	55.160 ⁵⁰	31.32 ¹¹
May 10.0	38.390 ¹⁴⁸	12.50 ¹⁹⁵	6.464 ¹⁰⁸	14.16 ⁴⁰	37.211 ⁶⁴	65.62 ²⁸⁵	55.257 ⁹⁷	31.65 ³³
20.0	38.611 ²²¹	10.80 ¹⁷⁰	6.623 ¹⁵⁹	14.00 ¹⁶	37.326 ¹¹⁵	62.67 ²⁹⁶	55.400 ¹⁴³	32.19 ⁵⁴
	293	144	205	7	164	299	186	76
29.9	38.904	9.36	6.828	14.07	37.490	59.68	55.586	32.95
June 8.9	39.257 ³⁵³	8.27 ¹⁰⁹	7.074 ²⁴⁶	14.41 ³⁴	37.698 ²⁰⁸	56.71 ²⁰⁷	55.812 ²²⁶	33.91 ⁹⁶
18.9	39.664 ⁴⁰⁷	7.55 ⁷²	7.356 ²⁸²	14.98 ⁵⁷	37.945 ²⁴⁷	53.85 ²⁸⁶	56.071 ²⁵⁹	35.05 ¹¹⁴
28.8	40.112 ⁴⁴⁸	7.21 ³⁴	7.666 ³¹⁰	15.80 ⁸²	38.225 ²⁸⁰	51.17 ²⁶⁸	56.356 ²⁸⁵	36.34 ¹²⁹
July 8.8	40.591 ⁴⁷⁹	7.26 ⁵	7.995 ³²⁹	16.82 ¹⁰²	38.531 ³⁰⁶	48.72 ²⁴⁵	56.662 ³⁰⁶	37.75 ¹⁴¹
	496	43	341	121	322	212	316	148
18.8	41.089	7.69	8.336	18.03	38.853	46.60	56.978	39.23
28.8	41.594 ⁵⁰⁵	8.51 ⁸²	8.682 ³⁴⁶	19.38 ¹³⁵	39.185 ³³²	44.85 ¹⁷⁵	57.299 ³²¹	40.75 ¹⁵²
Aug. 7.7	42.096 ⁵⁰²	9.68 ¹¹⁷	9.024 ³⁴²	20.83 ¹⁴⁵	39.518 ³³³	43.54 ¹³¹	57.617 ³¹⁸	42.26 ¹⁵¹
17.7	42.584 ⁴⁸⁸	11.16 ¹⁴⁸	9.356 ³⁸²	22.35 ¹⁵²	39.844 ³²⁶	42.69 ⁸⁵	57.926 ³⁰⁹	43.71 ¹⁴⁵
27.7	43.051 ⁴⁶⁷	12.93 ¹⁷⁷	9.672 ³¹⁶	23.90 ¹⁵⁵	40.154 ³¹⁰	42.33 ³⁶	58.221 ²⁹⁵	45.08 ¹³⁷
	439	203	296	154	291	16	275	123
Sept. 6.7	43.490	14.96	9.968	25.44	40.445	42.49	58.496	46.31
16.6	43.894 ⁴⁰⁴	17.18 ²²²	10.240 ²⁷²	26.94 ¹⁵⁰	40.708 ²⁶³	43.14 ⁶⁵	58.749 ²⁵³	47.40 ¹⁰⁹
26.6	44.258 ³⁶⁴	19.55 ²³⁷	10.485 ²⁴⁵	28.36 ¹⁴²	40.940 ²³²	44.26 ¹¹²	58.977 ²²⁸	48.32 ⁹²
Oct. 6.6	44.579 ³²¹	22.04 ²⁴⁹	10.701 ²¹⁶	29.70 ¹³⁴	41.138 ¹⁹⁶	45.81 ¹⁵⁵	59.177 ²⁰⁰	49.05 ⁷³
16.5	44.854 ²⁷⁵	24.61 ²⁵⁷	10.887 ¹⁸⁶	30.93 ¹²³	41.299 ¹⁶¹	47.71 ¹⁹⁰	59.349 ¹⁷²	49.61 ⁵⁶
	222	259	154	110	122	219	143	39
26.5	45.076	27.20	11.041	32.03	41.421	49.90	59.492	50.00
Nov. 5.5	45.245 ¹⁶⁹	29.73 ²⁵³	11.163 ¹²²	33.01 ⁹⁸	41.503 ⁸²	52.28 ²³⁸	59.605 ¹¹³	50.22 ²²
15.5	45.359 ¹¹⁴	32.19 ²⁴⁶	11.253 ⁹⁴	33.86 ⁸⁵	41.547 ⁴⁴	54.76 ²⁴⁸	59.687 ⁸²	50.31 ⁹
25.4	45.414 ⁵⁵	34.51 ²³²	11.307 ⁵⁰	34.55 ⁶⁹	41.551 ⁴	57.24 ²⁴⁸	59.739 ⁵²	50.27 ⁴
Dec. 5.4	45.409 ⁵	36.62 ²¹¹	11.327 ²⁰	35.11 ⁵⁶	41.517 ³⁴	59.63 ²³⁹	59.758 ¹⁹	50.12 ¹⁵
	62	185	16	40	70	220	13	25
15.4	45.347	38.47	11.311	35.51	41.447	61.83	59.745	49.87
25.4	45.227 ¹²⁰	40.00 ¹⁵³	11.261 ⁵⁰	35.73 ²²	41.343 ¹⁰⁴	63.78 ¹⁹⁵	59.701 ⁴⁴	49.55 ³²
35.3	45.054 ¹⁷³	41.16 ¹¹⁶	11.178 ⁸³	35.78 ⁵	41.210 ¹³³	65.39 ¹⁶¹	59.627 ⁷⁴	49.14 ⁴¹
Mean Place	37.944	7.10	5.632	9.16	37.016	74.56	54.428	26.31
Sec δ , Tan δ	1.768	+1.458	1.122	+0.508	1.189	-0.643	1.034	+0.263
$D_{\alpha} \alpha$, $D_{\alpha} \delta$	+0.09	-0.07	+0.07	-0.03	+0.05	+0.03	+0.07	-0.01
$D_{\delta} \delta$, $D_{\delta} \delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^3 Eridani. Mag. 4.8		τ Persei. Mag. 4.1		η Eridani. Mag. 4.0		ϵ Arietis (mean). Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 47	° ' " -21 20	h m 2 48	° ' " +52 25	h m 2 52	° ' " - 9 13	h m 2 54	° ' " +21 0
	s	"	s	"	s	"	s	"
Jan. 0.3	18.067	44.48	24.234	44.88	24.078	37.56	29.629	44.02
10.3	17.950 ¹¹⁷	45.73 ¹²⁵	24.059 ¹⁷⁵	45.73 ⁸⁵	23.984 ⁹⁴	38.63 ¹⁰⁷	29.542 ⁸⁷	43.80 ²²
20.3	17.812 ¹³⁸	46.70 ⁹⁷	23.843 ²¹⁶	46.20 ⁴⁷	23.865 ¹¹⁹	39.52 ⁸⁹	29.428 ¹¹⁴	43.48 ³³
30.3	17.656 ¹⁵⁶	47.33 ⁶⁸	23.598 ²⁴⁵	46.23 ³	23.729 ¹³⁶	40.19 ⁶⁷	29.292 ¹³⁶	43.05 ⁴³
Feb. 9.2	17.489 ¹⁶⁷	47.62 ²⁹	23.334 ²⁶⁴	45.83 ⁴⁰	23.581 ¹⁴⁸	40.65 ⁴⁶	29.142 ¹⁵⁰	42.51 ⁵⁴
	170	4	267	80	153	21	157	62
19.2	17.319	47.58	23.067	45.03	23.428	40.86	28.985	41.89
Mar. 1.2	17.155 ¹⁶⁴	47.18 ⁴⁰	22.811 ²⁵⁶	43.85 ¹¹⁸	23.278 ¹⁵⁰	40.83 ³	28.831 ¹⁵⁴	41.21 ⁶⁸
11.2	17.004 ¹⁵¹	46.44 ⁷⁴	22.580 ²³¹	42.36 ¹⁴⁹	23.139 ¹³⁹	40.55 ²⁸	28.691 ¹⁴⁰	40.49 ⁷²
21.1	16.875 ¹²⁹	45.38 ¹⁰⁶	22.388 ¹⁹²	40.60 ¹⁷⁶	23.022 ¹¹⁷	40.03 ⁵²	28.574 ¹¹⁷	39.80 ⁶⁹
31.1	16.776 ⁹⁹	44.02 ¹³⁶	22.248 ¹⁴⁰	38.67 ¹⁹³	22.932 ⁹⁰	39.24 ⁷⁹	28.487 ⁸⁷	39.15 ⁶⁵
	63	166	79	202	54	102	49	57
Apr. 10.1	16.713	42.36	22.169	36.65	22.878	38.22	28.438	38.58
20.0	16.693 ²⁰	40.44 ¹⁹²	22.159 ¹⁰	34.62 ²⁰³	22.865 ¹³	36.94 ¹²⁸	28.435 ³	38.15 ⁴³
30.0	16.718 ²⁵	38.29 ²¹⁵	22.221 ⁶²	32.66 ¹⁹⁶	22.895 ³⁰	35.45 ¹⁴⁹	28.480 ⁴⁵	37.90 ²⁵
May 10.0	16.790 ⁷²	35.95 ²³⁴	22.357 ¹³⁶	30.86 ¹⁸⁰	22.970 ⁷⁵	33.74 ¹⁷¹	28.575 ⁹⁵	37.83 ⁷
20.0	16.908 ¹¹⁸	33.47 ²⁴⁸	22.562 ²⁰⁵	29.29 ¹⁵⁷	23.091 ¹²¹	31.87 ¹⁸⁷	28.717 ¹⁴²	37.98 ¹⁵
	163	257	271	130	164	201	186	36
29.9	17.071	30.90	22.833	27.99	23.255	29.86	28.903	38.34
June 8.9	17.275 ²⁰⁴	28.29 ²⁶¹	23.164 ³³¹	27.01 ⁹⁸	23.458 ²⁰⁸	27.75 ²¹¹	29.132 ²²⁹	38.93 ⁵⁹
18.9	17.514 ²³⁹	25.74 ²⁵⁵	23.543 ³⁷⁹	26.38 ⁶³	23.694 ²³⁶	25.61 ²¹⁴	29.395 ²⁶³	39.74 ⁸¹
28.9	17.784 ²⁷⁰	23.27 ²⁴⁷	23.961 ⁴¹⁸	26.13 ²⁵	23.958 ²⁶⁴	23.49 ²¹²	29.686 ²⁹¹	40.74 ¹⁰⁰
July 8.8	18.074 ²⁹⁰	20.98 ²²⁹	24.409 ⁴⁴⁸	26.25 ¹²	24.244 ²⁸⁶	21.44 ²⁰⁵	29.999 ³¹³	41.90 ¹¹⁶
	307	206	466	47	299	193	325	129
18.8	18.381	18.92	24.875	26.72	24.543	19.51	30.324	43.19
28.8	18.694 ³¹³	17.15 ¹⁷⁷	25.348 ⁴⁷³	27.56 ⁸⁴	24.848 ³⁰⁵	17.78 ¹⁷³	30.655 ³³¹	44.57 ¹²⁸
Aug. 7.7	19.007 ³¹⁸	15.72 ¹⁴³	25.819 ⁴⁷¹	28.72 ¹¹⁶	25.152 ³⁰⁴	16.28 ¹⁵⁰	30.984 ³²⁹	46.00 ¹⁴³
17.7	19.311 ³⁰⁴	14.68 ¹⁰⁴	26.279 ⁴⁶⁰	30.17 ¹⁴⁵	25.450 ²⁹⁸	15.06 ¹²²	31.305 ³²¹	47.45 ¹⁴⁵
27.7	19.603 ²⁹²	14.05 ⁶³	26.719 ⁴⁴⁰	31.89 ¹⁷²	25.735 ²⁸⁵	14.16 ⁹⁰	31.612 ³⁰⁷	48.86 ¹⁴¹
	272	19	415	194	266	55	289	135
Sept. 6.7	19.875	13.86	27.134	33.83	26.001	13.61	31.901	50.21
16.6	20.123 ²⁴⁸	14.11 ²⁵	27.517 ³⁸³	35.96 ²¹³	26.246 ²⁴⁵	13.41 ²⁰	32.167 ²⁶⁶	51.47 ¹²⁶
26.6	20.343 ²²⁰	14.78 ⁶⁷	27.863 ³⁴⁶	38.21 ²²⁵	26.465 ²¹⁹	13.56 ¹⁵	32.410 ²⁴³	52.61 ¹¹⁴
Oct. 6.6	20.533 ¹⁹⁰	15.83 ¹⁰⁵	28.169 ³⁰⁶	40.57 ²³⁶	26.657 ¹⁹²	14.03 ⁴⁷	32.625 ²¹⁵	53.62 ¹⁰¹
16.6	20.691 ¹⁵⁸	17.21 ¹³⁸	28.432 ²⁶³	42.90 ²⁴²	26.820 ²⁴²	14.81 ⁷⁸	32.812 ¹⁸⁷	54.50 ⁸⁸
	124	167	217	242	134	103	156	72
26.5	20.815	18.88	28.649	45.41	26.954	15.84	32.968	55.22
Nov. 5.5	20.906 ⁹¹	20.74 ¹⁸⁶	28.817 ¹⁶⁸	47.80 ²³⁹	27.057 ¹⁰³	17.07 ¹²³	33.094 ¹²⁶	55.82 ⁶⁰
15.5	20.962 ⁵⁶	22.72 ¹¹⁶	28.933 ¹¹⁶	50.10 ²³⁰	27.128 ⁷¹	18.44 ¹³⁷	33.190 ⁹⁶	56.28 ⁴⁶
25.4	20.984 ²²	24.75 ²⁰³	28.996 ⁶³	52.25 ²¹⁵	27.169 ⁴¹	19.89 ¹⁴⁵	33.251 ⁶¹	56.61 ³³
Dec. 5.4	20.973 ¹¹	26.73 ¹⁹⁸	29.004 ⁸	54.22 ¹⁹⁷	27.177 ⁸	21.35 ¹⁴⁶	33.279 ²⁸	56.81 ²⁰
	43	187	48	172	22	142	5	9
15.4	20.930	28.60	28.956	55.94	27.155	22.77	33.274	56.90
25.4	20.855 ⁷⁵	30.28 ¹⁶⁸	28.855 ¹⁰¹	57.37 ¹⁴³	27.103 ⁵²	24.10 ¹³³	33.234 ⁴⁰	56.87 ³
35.3	20.751 ¹⁰⁴	31.73 ¹⁴⁵	28.705 ¹⁵⁰	58.44 ¹⁰⁷	27.022 ⁸¹	25.28 ¹¹⁸	33.162 ⁷²	56.72 ¹⁵
Mean Place	16.333	43.61	21.811	25.44	22.329	40.10	27.735	32.67
Sec δ , Tan δ	1.074	-0.391	1.640	+1.300	1.013	-0.162	1.071	+0.384
$D\psi\alpha$, $D_\omega\alpha$	+0.05	+0.02	+0.08	-0.06	+0.06	+0.01	+0.07	-0.02
$D\psi\delta$, $D_\omega\delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	47 H. Cephei. Mag. 5.7		θ Eridani. Mag. 3.4		α Ceti. Mag. 2.8		τ^3 Eridani. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 54	° ' " +79 5	h m 2 55	° ' " -40 37	h m 2 57	° ' " + 3 45	h m 2 58	° ' " -23 56
	s	"	s	"	s	"	s	"
Jan. 0.3	65.57	55.41 180	8.843	77.75 152	58.131	59.57 75	45.736	58.21 139
10.3	64.81 76	57.21 124	8.666 177	79.27 106	58.048 83	58.82 75	45.618 118	59.60 105
20.3	63.92 89	58.45 66	8.462 204	80.33 58	57.940 108	58.14 68	45.477 141	60.65 71
30.3	62.94 96	59.11 4	8.240 222	80.91 10	57.812 128	57.52 62	45.315 162	61.36 35
Feb. 9.2	61.92 102	59.15 53	8.006 234	81.01 38	57.670 142	56.99 43	45.141 174	61.71 2
19.2	60.90 102	58.60 113	7.771 235	80.63 86	57.522 148	56.56 31	44.962 179	61.69 39
Mar. 1.2	59.92 98	57.47 166	7.541 230	79.77 131	57.376 146	56.25 16	44.787 175	61.30 76
11.2	59.04 88	55.81 211	7.328 213	78.46 172	57.240 136	56.09 2	44.624 163	60.54 110
21.1	58.28 78	53.70 247	7.140 188	76.74 210	57.126 114	56.07 16	44.481 143	59.44 142
31.1	57.70 40	51.23 272	6.987 153	74.64 242	57.040 86	56.23 34	44.368 78	58.02 173
Apr. 10.1	57.30 19	48.51 287	6.876 63	72.22 272	56.987 11	56.57 54	44.290 36	56.29 200
20.0	57.11 3	45.64 292	6.813 10	69.50 294	56.976 34	57.11 76	44.254 10	54.29 223
30.0	57.14 26	42.72 285	6.803 45	66.56 311	57.010 79	57.87 94	44.264 57	52.06 243
May 10.0	57.40 46	39.87 267	6.848 99	63.45 320	57.089 124	58.81 116	44.321 105	49.63 258
20.0	57.86 67	37.20 243	6.947 152	60.25 322	57.213 167	59.97 133	44.426 150	47.05 265
29.9	58.53 84	34.77 211	7.099 202	57.03 317	57.380 206	61.30 147	44.576 193	44.40 269
June 8.9	59.37 99	32.66 172	7.301 247	53.86 303	57.586 239	62.77 160	44.769 230	41.71 264
18.9	60.36 112	30.94 128	7.548 284	50.83 284	57.825 268	64.37 168	44.999 262	39.07 253
28.9	61.48 123	29.66 82	7.832 315	47.99 254	58.093 288	66.05 170	45.261 286	36.54 237
July 8.8	62.71 130	28.84 33	8.147 337	45.45 218	58.381 302	67.75 168	45.547 304	34.17 212
18.8	64.01 133	28.51 15	8.484 351	43.27 177	58.683 307	69.43 161	45.851 313	32.05 182
28.8	65.34 135	28.66 64	8.835 356	41.50 129	58.990 307	71.04 150	46.164 316	30.23 145
Aug. 7.7	66.69 133	29.30 110	9.191 349	40.21 79	59.297 307	72.54 134	46.480 310	28.78 105
17.7	68.02 129	30.40 155	9.540 338	39.42 24	59.596 288	73.88 114	46.790 297	27.73 62
27.7	69.31 122	31.95 195	9.878 316	39.18 31	59.884 271	75.02 91	47.087 281	27.11 16
Sept. 6.7	70.53 114	33.90 232	10.194 290	39.49 85	60.155 250	75.93 66	47.368 257	26.95 30
16.6	71.67 104	36.22 266	10.484 256	40.34 136	60.405 227	76.59 41	47.625 232	27.25 74
26.6	72.71 92	38.88 292	10.740 218	41.70 182	60.632 200	77.00 16	47.857 201	27.99 114
Oct. 6.6	73.63 77	41.80 315	10.958 178	43.52 220	60.832 173	77.16 8	48.058 169	29.13 151
16.6	74.40 60	44.95 330	11.136 134	45.72 251	61.005 146	77.08 30	48.227 136	30.64 179
26.5	75.00 44	48.25 338	11.270 90	48.23 270	61.151 116	76.78 47	48.363 101	32.43 200
Nov. 5.5	75.44 25	51.63 337	11.360 43	50.93 280	61.267 87	76.31 62	48.464 65	34.43 215
15.5	75.69 6	55.00 330	11.403 0	53.73 280	61.354 55	75.69 73	48.529 30	36.58 219
25.4	75.75 13	58.30 313	11.403 87	56.53 268	61.409 24	74.96 82	48.559 39	38.77 203
Dec. 5.4	75.62 33	61.43 287	11.358 125	59.21 180	61.433 6	74.17 82	48.554 73	40.91 184
15.4	75.29 51	64.30 251	11.271 161	61.67 215	61.427 39	73.35 80	48.515 102	42.94 157
25.4	74.78 68	66.81 208	11.146 125	63.82 180	61.388 69	72.53 80	48.442 102	44.78 157
35.3	74.10 68	68.89 208	10.985 161	65.62 180	61.319 69	71.73 80	48.340 102	46.35 157
Mean Place	59.610	32.52	6.964	72.34	56.323	53.30	43.945	56.75
Sec δ , Tan δ	5.285	+5.190	1.817	-0.858	1.002	+0.066	1.094	-0.444
D δ a, D α a	+0.16	-0.25	+0.05	+0.04	+0.06	0.00	+0.05	+0.02
D δ δ , D α δ	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Persei. Mag. 3.1		ρ Persei. Var. 3.4-4.2		μ Horologii. Mag. 5.2		θ Hydr. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 58	° ' " +53 10	h m 2 59	° ' " +38 31	h m 3 1	° ' " -60 2	h m 3 2	° ' " -72 13
	s	"	s	"	s	"	s	"
Jan. 0.3	49.098	75.80	53.284	25.73	41.48	101.31	7.39	45.25
10.3	48.928 170	76.77 97	53.173 111	26.18 45	41.14 34	102.88 157	6.76 63	46.68 143
20.3	48.714 214	77.34 57	53.029 144	26.33 15	40.77 37	103.91 103	6.08 68	47.55 87
30.3	48.466 248	77.49 15	52.857 172	26.20 13	40.37 40	104.36 45	5.36 72	47.82 27
Feb. 9.2	48.198 268	77.22 27	52.667 190	25.79 41	39.95 42	104.24 12	4.62 74	47.50 32
19.2	47.923 275	76.53 69	52.470 197	25.09 70	39.54 41	103.55 69	3.89 73	46.60 90
Mar. 1.2	47.656 267	75.44 109	52.277 193	24.16 93	39.14 40	102.33 122	3.19 70	45.14 146
11.2	47.410 246	74.03 141	52.100 177	23.02 114	38.77 37	100.60 173	2.53 66	43.19 196
21.1	47.203 207	72.34 169	51.950 150	21.73 129	38.43 34	98.42 218	1.94 59	40.79 240
31.1	47.047 166	70.45 189	51.838 112	20.35 138	38.14 29	95.83 259	1.42 52	38.02 277
Apr. 10.1	46.952 95	68.44 201	51.773 65	18.94 141	37.92 22	92.90 298	1.00 42	34.89 313
20.0	46.925 27	66.40 204	51.761 12	17.57 137	37.76 16	89.70 320	0.70 30	31.54 335
30.0	46.972 47	64.41 199	51.806 45	16.31 126	37.67 9	86.28 342	0.50 20	27.99 355
May 10.0	47.092 120	62.55 186	51.909 103	15.21 110	37.67 0	82.73 355	0.42 8	24.35 364
20.0	47.285 193	60.90 165	52.068 159	14.32 89	37.74 7	79.14 359	0.46 4	20.69 366
29.9	47.546 261	59.49 141	52.281 213	13.68 64	37.89 15	75.58 356	0.63 17	17.10 359
June 8.9	47.868 322	58.40 109	52.543 262	13.30 38	38.11 22	72.14 344	0.91 28	13.68 342
18.9	48.242 374	57.64 76	52.846 303	13.21 9	38.40 29	68.89 325	1.30 39	10.48 320
28.9	48.658 416	57.25 39	53.181 335	13.42 21	38.75 35	65.93 296	1.79 49	7.60 288
July 8.8	49.107 449	57.21 4	53.542 361	13.91 49	39.15 40	63.34 259	2.37 58	5.12 248
18.8	49.575 468	57.54 33	53.918 376	14.67 76	39.59 44	61.18 216	3.02 65	3.10 202
28.8	50.055 490	58.23 69	54.302 384	15.66 99	40.06 47	59.52 166	3.72 70	1.60 150
Aug. 7.7	50.535 480	59.24 101	54.686 384	16.88 122	40.55 49	58.42 110	4.44 72	0.68 92
17.7	51.006 471	60.56 132	55.062 376	18.26 138	41.03 48	57.91 51	5.18 74	0.36 32
27.7	51.461 455	62.16 160	55.423 361	19.78 152	41.49 46	58.01 10	5.90 72	0.66 30
Sept. 6.7	51.891 430	63.98 182	55.764 341	21.43 165	41.93 44	58.71 70	6.57 67	1.59 93
16.6	52.291 400	66.01 203	56.082 318	23.13 170	42.34 41	60.00 129	7.19 62	3.10 151
26.6	52.657 366	68.19 218	56.372 290	24.87 174	42.70 36	61.85 185	7.74 55	5.14 204
Oct. 6.6	52.984 327	70.48 229	56.631 259	26.62 175	43.00 30	64.19 234	8.19 45	7.66 252
16.6	53.267 283	72.85 237	56.859 228	28.35 173	43.24 24	66.92 273	8.53 34	10.57 291
26.5	53.504 237	75.25 240	57.051 192	30.03 168	43.41 17	69.96 304	8.74 21	13.75 318
Nov. 5.5	53.691 187	77.63 238	57.207 156	31.63 160	43.50 9	73.18 322	8.83 9	17.08 333
15.5	53.827 136	79.94 231	57.324 117	33.14 151	43.51 1	76.46 328	8.79 4	20.45 337
25.4	53.907 80	82.14 220	57.400 76	34.52 138	43.45 6	79.69 323	8.62 17	23.73 328
Dec. 5.4	53.931 24	84.16 202	57.435 35	35.74 122	43.32 13	82.73 304	8.32 30	26.78 306
15.4	53.897 34	85.97 181	57.427 8	36.79 106	43.12 20	85.50 277	7.92 40	29.51 273
25.4	53.807 90	87.48 151	57.376 51	37.62 83	42.86 26	87.87 237	7.42 50	31.82 231
35.3	53.662 145	88.66 118	57.286 90	38.20 58	42.55 31	89.77 190	6.83 59	33.61 179
Mean Place	46.536	56.74	51.117	9.94	39.177	92.87	4.324	35.69
Sec δ , Tan δ	1.669	+1.336	1.278	+0.796	2.003	-1.736	3.275	-3.119
$D_{\gamma} \alpha$, $D_{\gamma} \delta$	+0.09	-0.06	+0.08	-0.04	+0.03	+0.08	0.00	+0.15
$D_{\rho} \delta$, $D_{\mu} \delta$	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Persei. (Algol.) Var. 2.1-3.2			δ Arietis. Mag. 4.5			12 Eridani. Mag. 4.0			48 H. Cephei. Mag. 5.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 3 2	s 3 2	° ' " +40 38	h m 3 6	s 3 6	° ' " +19 24	h m 3 8	s 3 8	° ' " -29 18	h m 3 9	s 3 9	° ' " +77 25
Jan. 0.4	47.956		28.58	54.742		59.73	34.512		52.12	50.12		75.23
10.3	47.841	115	29.13	54.663	79	59.49	34.385	127	53.63	49.52	60	77.12
20.3	47.691	150	29.37	54.554	109	59.17	34.232	153	54.79	48.79	73	78.50
30.3	47.513	178	29.31	54.422	132	58.76	34.057	175	55.55	47.97	82	79.31
Feb. 9.2	47.315	198	28.94	54.274	148	58.26	33.868	189	55.90	47.10	87	79.53
19.2	47.110	205	28.27	54.117	157	57.70	33.673	195	55.84	46.21	89	79.15
Mar. 1.2	46.908	202	27.34	53.960	157	57.09	33.479	194	55.38	45.35	86	78.19
11.2	46.721	187	26.17	53.814	146	56.46	33.297	182	54.52	44.57	78	76.70
21.1	46.563	158	24.84	53.689	125	55.85	33.136	161	53.27	43.88	69	74.75
31.1	46.444	119	23.40	53.593	96	55.29	33.004	132	51.67	43.32	56	72.42
Apr. 10.1	46.372	72	21.91	53.536	57	54.81	32.907	97	49.75	42.94	38	69.80
20.1	46.355	17	20.44	53.521	15	54.47	32.853	54	47.53	42.72	22	67.02
30.0	46.397	42	19.07	53.553	32	54.29	32.846	7	45.08	42.69	3	64.16
May 10.0	46.497	100	17.85	53.634	81	54.29	32.888	42	42.42	42.87	18	61.33
20.0	46.657	180	16.83	53.763	129	54.50	32.980	92	39.62	43.22	35	58.65
29.9	46.872	215	16.06	53.938	175	54.90	33.119	139	36.75	43.76	54	56.17
June 8.9	47.136	264	15.56	54.154	216	55.53	33.304	185	33.86	44.45	69	53.99
18.9	47.443	307	15.36	54.407	253	56.35	33.529	225	31.02	45.29	84	52.16
28.9	47.785	342	15.46	54.688	281	57.34	33.789	260	28.32	46.25	96	50.75
July 8.8	48.153	368	15.84	54.993	305	58.49	34.075	286	25.83	47.31	106	49.77
18.8	48.538	385	16.51	55.311	318	59.75	34.382	307	23.61	48.43	112	49.27
28.8	48.931	393	17.43	55.637	326	61.08	34.700	318	21.71	49.60	117	49.23
Aug. 7.8	49.324	396	18.58	55.963	326	62.44	35.024	324	20.22	50.79	119	49.67
17.7	49.711	387	19.93	56.283	320	63.80	35.344	320	19.17	51.98	119	50.56
27.7	50.083	372	21.44	56.591	306	65.12	35.654	310	18.59	53.14	116	51.90
Sept. 6.7	50.435	352	23.08	56.884	293	66.36	35.948	294	18.51	54.25	111	53.65
16.6	50.764	329	24.81	57.157	273	67.49	36.221	273	18.92	55.30	105	55.78
26.6	51.064	300	26.60	57.405	248	68.51	36.466	245	19.81	56.25	95	58.23
Oct. 6.6	51.333	269	28.41	57.630	225	69.38	36.681	215	21.13	57.11	86	60.98
16.6	51.570	237	30.22	57.827	197	70.11	36.864	183	22.84	57.85	74	63.96
26.5	51.771	201	32.00	57.995	168	70.70	37.011	147	24.87	58.46	61	67.11
Nov. 5.5	51.934	163	33.72	58.134	139	71.16	37.121	110	27.12	58.91	45	70.37
15.5	52.057	123	35.34	58.241	107	71.49	37.194	73	29.51	59.22	31	73.66
25.5	52.138	81	36.84	58.315	74	71.70	37.228	34	31.94	59.36	14	76.90
Dec. 5.4	52.175	37	38.20	58.357	42	71.80	37.225	3	34.33	59.32	4	80.00
15.4	52.168	7	39.36	58.363	6	71.81	37.184	41	36.58	59.11	21	82.88
25.4	52.117	51	40.31	58.334	29	71.71	37.107	77	38.60	58.73	38	85.44
35.3	52.024	93	40.99	58.271	63	71.52	36.997	110	40.33	58.21	52	87.60
Mean Place	45.724		12.42	52.788		49.19	32.655		49.45	44.362		53.42
Sec δ , Tan δ	1.318		+0.858	1.060		+0.352	1.147		-0.561	4.596		+4.486
$D_{\alpha} \alpha$, $D_{\alpha} \delta$	+0.08		-0.04	+0.07		-0.02	+0.05		+0.03	+0.15		-0.20
$D_{\delta} \delta$, $D_{\delta} \delta$	+0.3		+0.7	+0.3		+0.7	+0.3		+0.7	+0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Arietis. Mag. 5.0		38 G. Horologii. Mag. 5.7		ζ Eridani. Mag. 4.9		τ Arietis. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 10	° ' " +20 44	h m 3 10	° ' " -57 37	h m 3 11	° ' " - 9 7	h m 3 16	° ' " +20 50
Jan. 0.4	9.614	26.05	29.062	63.44	49.866	35.64	27.949	65.60
10.3	9.535	25.87	28.763	65.14	49.781	36.77	27.875	65.44
20.3	9.427	25.58	28.425	66.31	49.668	37.74	27.769	65.17
30.3	9.295	25.19	28.061	66.92	49.533	38.48	27.638	64.81
Feb. 9.2	9.145	24.72	27.682	66.96	49.383	39.00	27.489	64.36
19.2	8.986	24.16	27.300	66.44	49.225	39.27	27.329	63.83
Mar. 1.2	8.827	23.54	26.925	65.38	49.067	39.32	27.168	63.23
11.2	8.678	22.89	26.572	63.82	48.920	39.10	27.016	62.60
21.1	8.550	22.23	26.254	61.79	48.788	38.63	26.883	61.97
31.1	8.450	21.62	25.980	59.33	48.683	37.90	26.779	61.36
Apr. 10.1	8.389	21.09	25.760	56.54	48.611	36.93	26.712	60.83
20.1	8.371	20.68	25.602	53.43	48.580	35.71	26.688	60.41
30.0	8.399	20.42	25.515	50.11	48.591	34.27	26.711	60.14
May 10.0	8.477	20.33	25.498	46.63	48.647	32.63	26.783	60.03
20.0	8.604	20.43	25.557	43.08	48.750	30.79	26.903	60.11
29.9	8.776	20.76	25.688	39.55	48.895	28.83	27.070	60.41
June 8.9	8.991	21.28	25.889	36.10	49.081	26.75	27.280	60.90
18.9	9.243	22.02	26.155	32.84	49.302	24.64	27.527	61.60
28.9	9.524	22.93	26.480	29.82	49.555	22.52	27.804	62.47
July 8.8	9.829	24.00	26.853	27.16	49.829	20.47	28.106	63.49
18.8	10.148	25.20	27.264	24.90	50.120	18.54	28.424	64.65
28.8	10.476	26.48	27.703	23.14	50.421	16.78	28.751	65.89
Aug. 7.8	10.805	27.81	28.157	21.90	50.725	15.27	29.079	67.18
17.7	11.128	29.15	28.613	21.25	51.023	14.02	29.403	68.48
27.7	11.441	30.46	29.059	21.21	51.312	13.10	29.718	69.75
Sept. 6.7	11.736	31.71	29.484	21.77	51.585	12.51	30.017	70.96
16.6	12.012	32.86	29.877	22.93	51.841	12.29	30.297	72.08
26.6	12.266	33.90	30.227	24.65	52.074	12.42	30.555	73.10
Oct. 6.6	12.495	34.82	30.524	26.87	52.282	12.89	30.790	73.99
16.6	12.696	35.61	30.762	29.51	52.463	13.67	30.997	74.76
26.5	12.868	36.26	30.938	32.48	52.614	14.71	31.177	75.39
Nov. 5.5	13.011	36.78	31.046	35.65	52.736	15.97	31.326	75.90
15.5	13.122	37.18	31.082	38.92	52.827	17.39	31.444	76.29
25.5	13.200	37.46	31.051	42.16	52.886	18.88	31.529	76.56
Dec. 5.4	13.245	37.63	30.950	45.24	52.912	20.40	31.580	76.73
15.4	13.253	37.70	30.787	48.07	52.906	21.88	31.594	76.81
25.4	13.226	37.67	30.565	50.53	52.867	23.28	31.573	76.79
35.3	13.165	37.54	30.292	52.55	52.797	24.55	31.517	76.67
Mean Place	7.630	15.26	26.793	55.60	48.028	38.13	25.929	54.99
Sec δ, Tan δ	1.069	+0.379	1.868	-1.577	1.013	-0.161	1.070	+0.381
Dψ α, Dω α	+0.07	-0.02	+0.03	+0.07	+0.06	+0.01	+0.07	-0.02
Dψ δ, Dω δ	+0.3	+0.7	+0.3	+0.7	+0.3	+0.7	+0.3	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Eridani. Mag. 4.3			ζ Hydri. Mag. 5.5			α Persei. Mag. 1.9			θ Tauri. Mag. 3.8		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	3 16		-43 22	3 17		-77 40	3 18		+49 34	3 20		+ 8 44
Jan. 0.4	38.765		77.02	64.19		100.85	25.954		17.71	22.605		22.58
10.3	38.592	173	78.76	63.26	93	102.44	25.822	132	18.70	22.535	70	21.97
20.3	38.388	204	80.05	62.24	102	103.47	25.644	178	19.33	22.436	99	21.38
30.3	38.161	227	80.84	61.16	108	103.88	25.429	215	19.59	22.312	124	20.82
Feb. 9.3	37.917	244	81.14	60.06	110	103.73	25.190	239	19.47	22.170	143	20.30
19.2	37.664	253	80.92	58.95	111	102.99	24.937	253	18.97	22.018	152	19.83
Mar. 1.2	37.415	249	80.22	57.88	107	101.69	24.685	252	18.11	21.863	155	19.43
11.2	37.180	235	79.02	56.87	101	99.89	24.449	236	16.92	21.716	147	19.11
21.1	36.968	212	77.40	55.94	93	97.65	24.243	206	15.47	21.588	128	18.91
31.1	36.788	180	75.37	55.12	82	94.97	24.080	163	13.81	21.464	104	18.83
Apr. 10.1	36.651	137	72.99	54.42	70	91.98	23.971	109	12.02	21.415	69	18.89
20.1	36.561	90	70.28	53.87	55	88.72	23.924	47	10.19	21.385	30	19.13
30.0	36.522	39	67.34	53.48	39	85.29	23.943	19	8.37	21.400	15	19.55
May 10.0	36.540	18	64.20	53.25	23	81.71	24.031	88	6.67	21.461	61	20.15
20.0	36.616	76	60.94	53.19	6	78.08	24.187	156	5.12	21.568	107	20.95
30.0	36.748	132	57.64	53.31	12	74.52	24.408	221	3.78	21.719	151	21.93
June 8.9	36.933	185	54.37	53.59	28	71.09	24.689	281	2.72	21.910	191	23.08
18.9	37.168	235	51.20	54.04	45	67.89	25.021	332	1.96	22.139	229	24.36
28.9	37.445	277	48.24	54.64	60	64.96	25.395	374	1.51	22.397	258	25.75
July 8.8	37.758	313	45.53	55.37	73	62.42	25.803	408	1.40	22.678	281	27.21
18.8	38.099	341	43.18	56.21	84	60.32	26.234	431	1.62	22.975	297	28.69
28.8	38.458	359	41.25	57.14	93	58.74	26.680	446	2.14	23.283	308	30.16
Aug. 7.8	38.827	369	39.80	58.12	98	57.72	27.130	450	2.97	23.593	310	31.56
17.7	39.196	380	38.87	59.13	101	57.30	27.575	445	4.08	23.898	305	32.85
27.7	39.558	362	38.48	60.14	101	57.46	28.009	434	5.43	24.195	297	33.99
Sept. 6.7	39.902	344	38.67	61.10	96	58.27	28.425	416	7.00	24.479	284	34.95
16.7	40.224	322	39.42	62.00	90	59.70	28.817	392	8.74	24.744	265	35.71
26.6	40.514	290	40.71	62.80	80	61.63	29.179	332	10.62	24.990	246	36.26
Oct. 6.6	40.770	256	42.50	63.47	67	64.09	29.509	330	12.61	25.212	222	36.58
16.6	40.984	214	44.70	63.99	52	66.93	29.801	292	14.68	25.409	197	36.71
26.5	41.153	169	47.25	64.33	34	70.08	30.053	262	16.80	25.579	170	36.64
Nov. 5.5	41.277	124	50.03	64.50	17	73.41	30.261	208	18.90	25.722	143	36.40
15.5	41.352	75	52.96	64.46	4	76.80	30.422	161	20.97	25.834	112	36.03
25.5	41.379	27	55.91	64.24	22	80.13	30.532	110	22.96	25.914	80	35.54
Dec. 5.4	41.358	21	58.78	63.84	40	83.25	30.590	58	24.82	25.963	49	34.98
15.4	41.290	68	61.43	63.26	58	86.08	30.591	1	26.49	25.977	14	34.38
25.4	41.178	112	63.82	62.53	73	88.51	30.539	52	27.93	25.957	20	33.75
35.4	41.027	151	65.83	61.67	86	90.46	30.433	106	29.09	25.905	52	33.12
Mean Place	36.756		71.60	60.035		91.67	23.335		0.45	20.663		15.33
Sec δ , Tan δ	1.376		-0.945	4.690		-4.582	1.542		+1.174	1.012		+0.164
$D_{\alpha} \alpha$, $D_{\alpha} \delta$	+0.04		+0.04	-0.03		+0.20	+0.08		-0.05	+0.06		-0.01
$D_{\delta} \delta$, $D_{\delta} \delta$	+0.3		+0.8	+0.3		+0.8	+0.3		+0.8	+0.3		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 H. Camelop. Mag. 4.4		ξ Tauri. Mag. 3.8		f Tauri. Mag. 4.3		ε Eridani. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 22	° ' " +59 39	h m 3 22	° ' " + 9 26	h m 3 26	° ' " +12 39	h m 3 29	° ' " - 9 43
	s	"	s	"	s	"	s	"
Jan. 0.4	23.405	26.93	42.084	45.68	19.302	19.25	3.035	76.12
10.3	23.215 ¹⁸⁰	28.33 ¹⁴⁰	42.016 ⁶⁸	45.09 ⁵⁹	19.236 ⁶⁶	18.79 ⁴⁶	2.955 ⁸⁰	77.34 ¹²²
20.3	22.967 ²⁴⁸	29.32 ⁹⁹	41.919 ⁹⁷	44.52 ⁵⁷	19.140 ⁹⁶	18.31 ⁴⁸	2.844 ¹¹¹	78.37 ¹⁰³
30.3	22.672 ²⁹⁵	29.87 ⁵⁵	41.796 ¹²³	43.98 ⁵⁴	19.016 ¹²⁴	17.83 ⁴⁸	2.709 ¹³⁵	79.16 ⁷⁹
Feb. 9.3	22.346 ³²⁶	29.95 ⁸	41.654 ¹⁴²	43.47 ⁵¹	18.873 ¹⁴³	17.34 ⁴⁹	2.557 ¹⁵²	79.73 ⁵⁷
	342	40	152	47	154	48	164	31
19.2	22.004	29.55	41.502	43.00	18.719	16.86	2.393	80.04
Mar. 1.2	21.664 ³⁴⁰	28.71 ⁸⁴	41.347 ¹⁵⁵	42.59 ⁴¹	18.562 ¹⁵⁷	16.41 ⁴⁵	2.228 ¹⁶⁵	80.11 ⁷
11.2	21.344 ³²⁰	27.45 ¹²⁶	41.200 ¹⁴⁷	42.26 ³³	18.411 ¹⁵¹	16.01 ⁴⁰	2.070 ¹⁵⁸	79.91 ²⁰
21.1	21.063 ²⁸¹	25.83 ¹⁶²	41.069 ¹³¹	42.04 ²²	18.277 ¹³⁴	15.67 ³⁴	1.927 ¹⁴³	79.45 ⁴⁶
31.1	20.836 ²²⁷	23.94 ¹⁸⁹	40.964 ¹⁰⁶	41.93 ¹¹	18.170 ¹⁰⁷	15.43 ²⁴	1.810 ¹¹⁷	78.73 ⁷²
	160	211	70	3	74	12	85	96
Apr. 10.1	20.676	21.83	40.894	41.96	18.096	15.31	1.725	77.77
20.1	20.595 ⁸¹	19.61 ²²²	40.862 ³²	42.16 ²⁰	18.063 ³³	15.32 ¹	1.677 ⁴⁸	76.55 ¹²²
30.0	20.599 ⁴	17.36 ²²⁵	40.875 ¹³	42.53 ³⁷	18.074 ¹¹	15.51 ¹⁹	1.673 ⁴	75.11 ¹⁴⁴
May 10.0	20.689 ⁹⁰	15.17 ²¹⁹	40.933 ⁵⁸	43.08 ⁵⁵	18.131 ⁵⁷	15.87 ³⁶	1.714 ⁴¹	73.45 ¹⁶⁶
20.0	20.864 ¹⁷⁶	13.13 ²⁰⁴	41.039 ¹⁰⁶	43.84 ⁷⁶	18.236 ¹⁰⁵	16.42 ⁵⁵	1.801 ⁸⁷	71.62 ¹⁸³
	257	185	150	93	149	74	131	197
30.0	21.121	11.28	41.189	44.77	18.385	17.16	1.932	69.65
June 8.9	21.453 ³³²	9.71 ¹⁵⁷	41.379 ¹⁹⁰	45.85 ¹⁰⁸	18.576 ¹⁹¹	18.07 ⁹¹	2.105 ¹⁷³	67.59 ²⁰⁶
18.9	21.851 ³⁹⁸	8.46 ¹²⁵	41.607 ²²⁸	47.11 ¹²⁶	18.804 ²²⁸	19.13 ¹⁰⁶	2.314 ²⁰⁰	65.46 ²¹³
28.9	22.305 ⁴⁵⁴	7.54 ⁹²	41.865 ²⁵⁸	48.45 ¹³⁴	19.063 ²⁵⁹	20.33 ¹²⁰	2.554 ²⁴⁰	63.36 ²¹⁰
July 8.8	22.802 ⁴⁹⁷	7.01 ⁵³	42.146 ²⁸¹	49.88 ¹⁴³	19.346 ²⁸³	21.62 ¹²⁹	2.820 ²⁶⁶	61.32 ²⁰⁴
	529	16	297	145	301	135	284	193
18.8	23.331	6.85	42.443	51.33	19.647	22.97	3.104	59.39
28.8	23.880 ⁵⁴⁹	7.07 ²²	42.751 ³⁰⁸	52.77 ¹⁴⁴	19.957 ³¹⁰	24.33 ¹³⁶	3.398 ²⁹⁴	57.66 ¹⁷³
Aug. 7.8	24.438 ⁵⁵⁸	7.66 ⁵⁹	43.061 ³¹⁰	54.16 ¹³⁹	20.271 ³¹⁴	25.66 ¹³³	3.698 ³⁰⁰	56.13 ¹⁵³
17.7	24.993 ⁵⁵⁵	8.60 ⁹⁴	43.369 ³⁰⁸	55.45 ¹²⁹	20.582 ³¹¹	26.92 ¹²⁶	3.997 ²⁹⁹	54.91 ¹²²
27.7	25.535 ⁵⁴²	9.87 ¹²⁷	43.687 ²⁹⁸	56.58 ¹¹³	20.884 ³⁰²	28.07 ¹¹⁵	4.287 ²⁹⁰	54.00 ⁹¹
	522	157	286	97	290	102	278	55
Sept. 6.7	26.057	11.44	43.953	57.55	21.174	29.09	4.565	53.45
16.7	26.551 ⁴⁹⁴	13.27 ¹⁸³	44.222 ²⁶⁹	58.32 ⁷⁷	21.448 ²⁷⁴	29.94 ⁸⁵	4.825 ²⁶⁰	53.26 ¹⁹
26.6	27.009 ⁴⁵⁸	15.34 ²⁰⁷	44.468 ²⁴⁶	58.89 ⁵⁷	21.701 ²⁵³	30.62 ⁶⁸	5.065 ²⁴⁰	53.44 ¹⁸
Oct. 6.6	27.426 ⁴¹⁷	17.59 ²²⁵	44.693 ²²⁵	59.26 ³⁷	21.932 ²³¹	31.10 ⁴⁸	5.281 ²¹⁶	53.95 ⁵¹
16.6	27.797 ³⁷¹	19.98 ²³⁹	44.892 ¹⁹⁹	59.40 ¹⁴	22.137 ²⁰⁶	31.40 ³⁰	5.472 ¹⁹¹	54.80 ⁸⁵
	318	250	173	4	181	14	163	113
26.5	28.115	22.48	45.065	59.36	22.318	31.54	5.635	55.93
Nov. 5.5	28.375 ²⁶⁰	25.03 ²⁵⁵	45.210 ¹⁴⁵	59.16 ²⁰	22.469 ¹⁵¹	31.52 ²	5.769 ¹³⁴	57.27 ¹³⁴
15.5	28.573 ¹⁹⁸	27.59 ²⁵⁶	45.325 ¹¹⁵	58.82 ³⁴	22.590 ¹²¹	31.37 ¹⁵	5.870 ¹⁰¹	58.77 ¹⁵⁰
25.5	28.702 ¹²⁹	30.08 ²⁴⁹	45.408 ⁸³	58.37 ⁴⁵	22.681 ⁹¹	31.11 ²⁶	5.940 ⁷⁰	60.36 ¹⁵⁹
Dec. 5.4	28.763 ⁶¹	32.46 ²³⁸	45.460 ⁵²	57.85 ⁵²	22.737 ⁵⁶	30.78 ³³	5.976 ³⁶	61.98 ¹⁶²
	12	218	16	57	22	40	3	158
15.4	28.751	34.64	45.476	57.28	22.759	30.38	5.979	63.56
25.4	28.666 ⁸⁵	36.58 ¹⁹⁴	45.459 ¹⁷	56.69 ⁵⁹	22.745 ¹⁴	29.94 ⁴⁴	5.947 ³²	65.05 ¹⁴⁹
35.4	28.512 ¹⁵⁴	38.19 ¹⁶¹	45.408 ⁵¹	56.08 ⁶¹	22.697 ⁴⁸	29.48 ⁴⁶	5.881 ⁶⁶	66.41 ¹³⁶
Mean Place	20.239	8.13	40.128	38.30	17.304	11.11	1.141	78.21
Sec δ, Tan δ	1.979	+1.708	1.014	+0.166	1.025	+0.224	1.015	-0.172
Dψ α, Dα α	+0.10	-0.07	+0.06	-0.01	+0.06	-0.01	+0.06	+0.01
Dψ δ, Dα δ	+0.3	+0.8	+0.3	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^5 Eridani. Mag. 4.3			δ Persei. Mag. 3.1			δ Eridani. Mag. 3.7			ν Persei. Mag. 3.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	3 30		-21 54	3 37		+47 31	3 39		-10 2	3 39		+42 19
Jan. 0.4	9.119		39.15	3.208		39.42	18.243		35.44	35.532		17.52
10.3	9.023	96	40.72	3.102	106	40.44	18.171	72	36.72	35.444	88	18.33
20.3	8.896	127	41.98	2.949	153	41.15	18.069	102	37.79	35.312	132	18.88
30.3	8.744	152	42.92	2.756	193	41.53	17.939	130	38.64	35.142	170	19.14
Feb. 9.3	8.573	171	43.51	2.532	224	41.56	17.789	150	39.24	34.944	198	19.10
		181			240			163			216	
19.2	8.392		43.74	2.292		41.23	17.626		39.61	34.728		18.75
Mar. 1.2	8.209	183	43.61	2.046	246	40.55	17.459	167	39.72	34.507	221	18.11
11.2	8.032	177	43.14	1.811	235	39.56	17.297	162	39.55	34.296	211	17.21
21.2	7.872	160	42.30	1.601	210	38.30	17.148	149	39.13	34.104	192	16.08
31.1	7.736	136	41.13	1.427	174	36.83	17.023	125	38.44	33.947	157	14.79
		102			125			96			114	
Apr. 10.1	7.634		39.68	1.302		35.21	16.927		37.51	33.833		13.38
20.1	7.570	64	37.91	1.235	67	33.52	16.869	58	36.32	33.771	62	11.92
30.0	7.550	20	35.88	1.231	4	31.82	16.853	16	34.90	33.768	3	10.49
May 10.0	7.576	26	33.65	1.292	61	30.20	16.882	29	33.26	33.824	56	9.13
20.0	7.650	74	31.25	1.419	127	28.71	16.957	75	31.44	33.942	118	7.91
		120			192			119			176	
30.0	7.770		28.73	1.611		27.39	17.076		29.48	34.118		6.87
June 8.9	7.934	164	26.13	1.860	249	26.32	17.237	161	27.41	34.348	230	6.06
18.9	8.138	204	23.56	2.162	302	25.51	17.437	200	25.27	34.627	279	5.49
28.9	8.375	237	21.04	2.509	347	24.99	17.669	232	23.13	34.947	320	5.20
July 8.9	8.641	266	18.65	2.890	381	24.76	17.928	259	21.06	35.300	353	5.16
		287			408			278			377	
18.8	8.928		16.48	3.298		24.83	18.206		19.09	35.677		5.40
28.8	9.230	302	14.56	3.723	425	25.20	18.498	292	17.30	36.069	392	5.88
Aug. 7.8	9.538	308	12.98	4.156	433	25.85	18.796	308	15.74	36.471	402	6.60
17.7	9.846	308	11.78	4.589	433	26.74	19.096	300	14.46	36.870	399	7.53
27.7	10.147	301	11.00	5.015	426	27.87	19.390	294	13.50	37.264	394	8.65
		290			412			283			381	
Sept. 6.7	10.437		10.66	5.427		29.19	19.673		12.89	37.645		9.92
16.7	10.710	273	10.78	5.819	392	30.69	19.942	269	12.66	38.008	363	11.31
26.6	10.961	251	11.35	6.187	368	32.33	20.191	249	12.79	38.349	341	12.80
Oct. 6.6	11.187	226	12.35	6.525	338	34.08	20.419	228	13.28	38.663	314	14.36
16.6	11.384	197	13.72	6.831	306	35.92	20.622	203	14.10	38.949	286	15.96
		167			260			176			251	
26.6	11.551		15.42	7.100		37.80	20.798		15.21	39.200		17.59
Nov. 5.5	11.686	135	17.37	7.329	229	39.70	20.946	148	16.54	39.416	216	19.21
15.5	11.787	101	19.50	7.513	184	41.59	21.063	117	18.04	39.591	175	20.81
25.5	11.852	65	21.71	7.649	136	43.43	21.147	84	19.66	39.724	133	22.34
Dec. 5.4	11.880	28	23.91	7.734	85	45.17	21.199	52	21.32	39.810	86	23.78
		9			32			15			37	
15.4	11.871		26.03	7.766		46.76	21.214		22.93	39.847		25.10
25.4	11.828	43	28.00	7.742	24	48.17	21.194	20	24.46	39.835	12	26.24
35.4	11.749	79	29.74	7.664	78	49.34	21.141	53	25.86	39.772	63	27.18
Mean Place	7.202		38.44	0.504		23.67	16.294		37.56	32.977		2.94
Sec δ , Tan δ	1.078		-0.402	1.481		+1.092	1.016		-0.177	1.353		+0.910
$D_{\phi} \alpha$, $D_{\alpha} \alpha$	+0.05		+0.02	+0.08		-0.04	+0.06		+0.01	+0.08		-0.04
$D_{\phi} \delta$, $D_{\alpha} \delta$	+0.2		+0.8	+0.2		+0.8	+0.2		+0.8	+0.2		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	5 H. Camelop. Mag. 4.7		7 Tauri. (Alyone.) Mag. 3.0		16 Eridani. Mag. 4.3		8 Eridani. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 41	° ' " +71 4	h m 3 42	° ' " +23 50	h m 3 43	° ' " -23 29	h m 3 46	° ' " -36 26
	s	"	s	"	s	"	s	"
Jan. 0.4	39.24	59.46 197	35.042	68.07 1	18.568	37.64 170	22.981	66.35 198
10.4	38.93 31	61.43 154	34.983 59	68.08 1	18.475 93	39.34 170	22.852 129	68.33 198
20.3	38.53 40	62.97 106	34.889 94	67.99 9	18.349 126	40.75 141	22.687 165	69.92 159
30.3	38.05 48	64.02 51	34.762 127	67.78 21	18.197 152	41.82 107	22.493 194	71.08 116
Feb. 9.3	37.51 54	64.53 5	34.612 150	67.47 31	18.022 175	42.52 70	22.276 217	71.78 70
19.2	36.94 57	64.48 58	34.445 167	67.05 42	17.835 187	42.84 32	22.046 230	72.01 23
Mar. 1.2	36.36 58	63.90 58	34.273 172	66.53 52	17.644 191	42.80 4	21.811 235	71.78 23
11.2	35.81 55	62.80 110	34.107 166	65.94 59	17.457 187	42.38 42	21.582 229	71.09 69
21.2	35.32 49	61.24 156	33.955 152	65.30 64	17.285 172	41.60 78	21.370 212	69.95 114
31.1	34.90 42	59.28 196	33.830 125	64.64 66	17.136 149	40.47 113	21.183 187	68.42 153
Apr. 10.1	34.57 33	57.02 226	33.739 91	64.01 63	17.018 118	39.03 144	21.030 153	66.52 190
20.1	34.37 20	54.52 250	33.690 49	63.44 57	16.939 79	37.27 176	20.919 111	64.28 224
30.1	34.29 8	51.90 262	33.687 3	62.98 46	16.904 35	35.24 203	20.856 63	61.74 254
May 10.0	34.33 4	49.26 284	33.736 49	62.65 33	16.915 11	33.00 224	20.843 13	58.98 276
20.0	34.52 19	46.70 256	33.833 97	62.50 15	16.973 58	30.57 243	20.882 39	56.05 293
30.0	34.82 30	44.28 242	33.979 146	62.51 1	17.078 105	28.01 256	20.974 92	53.00 305
June 8.9	35.24 42	42.10 218	34.169 190	62.72 21	17.229 151	25.39 262	21.116 142	49.92 306
18.9	35.77 53	40.20 190	34.400 231	63.12 40	17.420 191	22.76 263	21.305 189	46.89 308
28.9	36.40 63	38.64 156	34.666 266	63.69 57	17.647 227	20.20 256	21.536 231	43.97 292
July 8.9	37.10 70	37.47 117	34.958 292	64.44 75	17.904 257	17.77 243	21.802 266	41.25 272
18.8	37.85 75	36.70 77	35.272 314	65.31 87	18.184 280	15.55 222	22.097 295	38.81 244
28.8	38.64 79	36.36 34	35.597 325	66.29 98	18.482 296	13.59 196	22.413 316	36.72 209
Aug. 7.8	39.47 83	36.44 8	35.929 332	67.35 106	18.789 307	11.97 162	22.742 329	35.04 168
17.8	40.30 83	36.93 49	36.261 332	68.44 109	19.097 308	10.74 123	23.076 334	33.84 120
27.7	41.13 83	37.84 91	36.587 326	69.55 111	19.401 304	9.93 81	23.408 332	33.14 70
Sept. 6.7	41.93 80	39.14 130	36.902 315	70.63 108	19.696 295	9.58 35	23.731 323	32.99 15
16.7	42.70 77	40.79 165	37.202 300	71.65 102	19.976 280	9.71 13	24.037 306	33.39 40
26.6	43.43 73	42.78 199	37.484 282	72.60 95	20.236 260	10.30 59	24.322 285	34.32 93
Oct. 6.6	44.09 66	45.04 226	37.744 260	73.47 87	20.473 237	11.34 104	24.580 258	35.77 145
16.6	44.69 60	47.57 253	37.981 237	74.24 77	20.682 209	12.77 143	24.805 225	37.65 188
26.6	45.21 52	50.28 271	38.190 209	74.90 66	20.862 180	14.55 178	24.996 191	39.93 228
Nov. 5.5	45.64 43	53.14 286	38.372 182	75.48 58	21.010 148	16.60 205	25.148 152	42.50 257
15.5	45.97 33	56.08 294	38.522 150	75.97 49	21.123 113	18.83 223	25.258 110	45.26 276
25.5	46.20 23	59.03 295	38.638 116	76.37 40	21.200 77	21.16 233	25.325 67	48.11 285
Dec. 5.5	46.30 10	61.92 289	38.717 79	76.69 32	21.239 39	23.50 234	25.348 23	50.95 254
15.4	46.28 2	64.66 274	38.758 41	76.92 23	21.241 2	25.77 227	25.326 22	53.67 272
25.4	46.15 13	67.17 251	38.760 2	77.07 15	21.204 37	27.88 211	25.260 66	56.18 251
35.4	45.91 24	69.35 218	38.722 38	77.13 6	21.130 74	29.77 189	25.154 106	58.39 221
Mean Place	34.461	40.54	32.843	57.71	16.595	36.69	20.924	62.88
Sec δ , Tan δ	3.085	+2.918	1.093	+0.442	1.090	-0.435	1.243	-0.739
$D\psi\alpha$, $D\omega\alpha$	+0.12	-0.11	+0.07	-0.02	+0.05	+0.02	+0.04	+0.03
$D\psi\delta$, $D\omega\delta$	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydri. Mag. 3.2		ζ Persei. Mag. 2.9		θ H. Camelop. Mag. 5.2		ϵ Persei. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 48	° ' " -74 29	h m 3 48	° ' " +31 38	h m 3 50	° ' " +60 51	h m 3 52	° ' " +39 46
	s	"	s	"	s	"	s	"
Jan. 0.4	34.33	44.67	56.997	29.05	6.52	78.17	19.355	29.53
10.4	33.66	46.72	56.936	29.43	6.35	79.82	19.285	30.28
20.3	32.91	48.25	56.834	29.64	6.12	81.10	19.169	30.82
30.3	32.09	49.21	56.699	29.67	5.84	81.97	19.015	31.09
Feb. 9.3	31.22	49.59	56.536	29.51	5.51	82.38	18.831	31.11
19.2	30.34	49.39	56.356	29.17	5.15	82.32	18.627	30.85
Mar. 1.2	29.46	48.63	56.168	28.64	4.79	81.80	18.413	30.33
11.2	28.60	47.33	55.984	27.94	4.43	80.84	18.206	29.55
21.2	27.81	45.53	55.817	27.13	4.11	79.48	18.015	28.58
31.1	27.08	43.28	55.676	26.23	3.84	77.78	17.855	27.43
Apr. 10.1	26.45	40.65	55.573	25.29	3.63	75.82	17.735	26.18
20.1	25.92	37.68	55.514	24.35	3.50	73.67	17.663	24.87
30.1	25.52	34.45	55.504	23.47	3.45	71.44	17.646	23.58
May 10.0	25.24	31.03	55.547	22.69	3.48	69.20	17.686	22.35
20.0	25.11	27.49	55.645	22.06	3.61	67.04	17.787	21.25
30.0	25.11	23.93	55.794	21.59	3.82	65.01	17.944	20.31
June 8.9	25.25	20.43	55.991	21.33	4.13	63.20	18.154	19.57
18.9	25.54	17.06	56.232	21.27	4.50	61.66	18.412	19.04
28.9	25.95	13.93	56.509	21.42	4.93	60.42	18.711	18.77
July 8.9	26.47	11.10	56.817	21.77	5.41	59.51	19.043	18.73
18.8	27.10	8.67	57.146	22.31	5.94	58.97	19.402	18.93
28.8	27.80	6.71	57.491	23.03	6.49	58.79	19.778	19.35
Aug. 7.8	28.57	5.28	57.845	23.87	7.06	58.97	20.163	20.00
17.8	29.38	4.42	58.199	24.83	7.64	59.50	20.550	20.82
27.7	30.20	4.18	58.547	25.88	8.21	60.38	20.933	21.80
Sept. 6.7	31.01	4.57	58.887	26.98	8.77	61.57	21.306	22.91
16.7	31.79	5.58	59.211	28.10	9.31	63.04	21.663	24.13
26.6	32.50	7.18	59.516	29.23	9.82	64.78	22.002	25.43
Oct. 6.6	33.13	9.34	59.801	30.34	10.30	66.74	22.317	26.79
16.6	33.65	11.98	60.060	31.42	10.73	68.91	22.606	28.19
26.6	34.03	14.99	60.292	32.46	11.11	71.23	22.864	29.60
Nov. 5.5	34.28	18.26	60.493	33.45	11.42	73.65	23.088	31.01
15.5	34.39	21.69	60.661	34.38	11.68	76.13	23.276	32.40
25.5	34.33	25.14	60.792	35.25	11.87	78.61	23.422	33.75
Dec. 5.5	34.14	28.49	60.885	36.04	11.99	81.04	23.524	35.02
15.4	33.80	31.61	60.934	36.73	12.03	83.35	23.578	36.19
25.4	33.31	34.41	60.939	37.31	11.99	85.45	23.583	37.23
35.4	32.71	36.78	60.901	37.77	11.88	87.29	23.538	38.10
Mean Place	30.514	36.94	54.636	17.23	2.934	61.14	16.786	16.22
Sec δ , Tan δ	3.740	-3.604	1.175	+0.616	2.054	+1.794	1.301	+0.832
$D_{\phi} a$, $D_{\omega} a$	-0.02	+0.13	+0.07	-0.02	+0.10	-0.06	+0.08	-0.03
$D_{\phi} \delta$, $D_{\omega} \delta$	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8	+0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Persei. Mag. 4.0		γ Eridani. Mag. 3.2		λ Tauri. Var. 3.3-4.2		δ Reticuli. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 53	° ' " +35 33	h m 3 54	° ' " -13 44	h m 3 56	° ' " +12 15	h m 3 57	° ' " -61 37
	s	"	s	"	s	"	s	"
Jan. 0.4	37.001	24.04 58	11.392	36.70 149	6.934	31.31 48	28.25 31	68.88 227
10.4	36.939	24.62 38	11.324	38.19 125	6.888	30.83 48	27.94 36	71.15 178
20.3	36.834	25.00 16	11.224	39.45 101	6.806	30.35 47	27.58 41	72.93 125
30.3	36.693	25.16 5	11.094	40.46 73	6.693	29.88 44	27.17 45	74.18 68
Feb. 9.3	36.521	25.11 29	10.941	41.19 44	6.555	29.44 43	26.72 46	74.86 11
19.3	36.331	24.82 50	10.772	41.63 14	6.400	29.01 39	26.26 47	74.97 46
Mar. 1.2	36.132	24.32 72	10.597	41.77 15	6.237	28.62 35	25.79 45	74.51 100
11.2	35.936	23.60 87	10.424	41.62 44	6.075	28.27 29	25.34 43	73.51 151
21.2	35.757	22.73 101	10.264	41.18 74	5.926	27.98 19	24.91 38	72.00 198
31.1	35.606	21.72 108	10.124	40.44 101	5.799	27.79 10	24.53 34	70.02 239
Apr. 10.1	35.493	20.64 111	10.014	39.43 74	5.701	27.69 2	24.19 27	67.63 277
20.1	35.425	19.53 108	9.940	38.15 33	5.642	27.71 17	23.92 21	64.86 307
30.1	35.409	18.45 100	9.907	36.61 12	5.625	27.88 29	23.71 13	61.79 329
May 10.0	35.448	17.45 87	9.919	34.86 57	5.654	28.21 76	23.58 5	58.50 344
20.0	35.544	16.58 70	9.976	32.93 103	5.730	28.70 122	23.53 4	55.06 353
30.0	35.693	15.88 52	10.079	30.83 146	5.852	29.37 82	23.57 12	51.53 351
June 8.9	35.892	15.36 29	10.225	28.63 184	6.016	30.19 204	23.69 96	48.02 342
18.9	36.138	15.07 9	10.409	26.39 220	6.220	31.15 287	23.89 108	44.60 324
28.9	36.422	14.98 15	10.629	24.15 216	6.457	32.23 265	24.16 117	41.36 296
July 8.9	36.738	15.13 35	10.878	21.99 203	6.722	33.40 285	24.49 121	38.40 260
18.8	37.078	15.48 54	11.148	19.96 185	7.007	34.61 299	24.88 123	35.80 217
28.8	37.436	16.02 72	11.434	18.11 168	7.306	35.84 309	25.32 118	33.63 167
Aug. 7.8	37.802	16.74 86	11.730	16.53 300	7.605	37.02 310	25.79 113	31.96 111
17.8	38.171	17.60 99	12.030	15.25 93	7.925	38.15 306	26.28 102	30.85 50
27.7	38.535	18.59 108	12.327	14.32 288	8.231	39.17 298	26.78 87	30.35 12
Sept. 6.7	38.889	19.67 114	12.615	13.77 14	8.529	40.04 286	27.27 70	30.47 75
16.7	39.230	20.81 120	12.891	13.63 26	8.815	40.74 271	27.74 53	31.22 137
26.6	39.552	22.01 121	13.150	13.89 65	9.086	41.27 251	28.18 35	32.59 193
Oct. 6.6	39.852	23.22 121	13.389	14.54 215	9.337	41.62 231	28.57 16	34.52 244
16.6	40.128	24.43 120	13.604	15.54 132	9.568	41.78 206	28.91 0	36.96 285
26.6	40.374	25.63 117	13.794	16.86 161	9.774	41.78 180	29.19 15	39.81 318
Nov. 5.5	40.589	26.80 114	13.955	18.44 130	9.954	41.63 151	29.38 28	42.99 337
15.5	40.769	27.94 109	14.085	20.20 97	10.105	41.35 120	29.50 37	46.36 344
25.5	40.911	29.03 102	14.182	22.07 62	10.225	40.98 85	29.54 4	49.80 340
Dec. 5.5	41.011	30.05 93	14.244	23.99 25	10.310	40.55 50	29.50 13	53.20 323
15.4	41.066	30.98 81	14.269	25.87 11	10.360	40.08 11	29.38 50	56.43 294
25.4	41.075	31.79 65	14.258	27.65 48	10.371	39.58 27	29.18 50	59.37 256
35.4	41.037	32.44	14.210	29.27	10.344	39.08	28.92	61.93
Mean Place	34.530	11.66	9.390	37.92	4.802	24.18	25.568	62.37
Sec δ , Tan δ	1.229	+0.715	1.029	-0.245	1.023	+0.217	2.105	-1.852
$D\psi\alpha$, $D\omega\alpha$	+0.08	-0.03	+0.06	+0.01	+0.07	-0.01	+0.02	+0.06
$D\psi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tauri. Mag. 3.9			α Tauri. Mag. 4.5			c Persei. Mag. 4.0			δ Tauri. Mag. 5.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 3 58	s + 5 45	° ' "	h m 3 59	s +21 51	° ' "	h m 4 2	s +47 29	° ' "	h m 4 5	s +26 15	° ' "
Jan. 0.4	46.472	41.07		49.395	31.11		40.744	45.44		48.730	64.88	
10.4	46.426	40.31	76	49.351	31.06	5	40.666	46.59	115	48.688	65.05	17
20.3	46.344	39.61	70	49.268	30.93	13	40.535	47.49	90	48.605	65.11	6
30.3	46.232	38.99	62	49.151	30.73	20	40.359	48.07	58	48.486	65.06	5
Feb. 9.3	46.096	38.45	54	49.008	30.45	28	40.144	48.33	26	48.339	64.90	16
19.3	45.942	38.00	45	48.845	30.09	36	39.906	48.24	9	48.170	64.60	30
Mar. 1.2	45.780	37.65	35	48.674	29.66	43	39.657	47.82	42	47.991	64.18	42
11.2	45.619	37.43	22	48.504	29.17	40	39.411	47.06	76	47.813	63.66	52
21.2	45.469	37.32	11	48.348	28.65	52	39.182	46.02	104	47.648	63.06	60
31.1	45.341	37.34	2	48.212	28.12	53	38.986	44.73	129	47.504	62.41	65
Apr. 10.1	45.241	37.53	19	48.109	27.61	51	38.834	43.26	147	47.393	61.74	67
20.1	45.179	37.37	34	48.046	27.17	44	38.736	41.68	158	47.322	61.10	64
30.1	45.157	38.39	52	48.028	26.81	36	38.698	40.04	164	47.297	60.51	59
May 10.0	45.180	39.09	70	48.057	26.59	22	38.725	38.42	162	47.321	60.02	49
20.0	45.249	39.95	86	48.135	26.50	9	38.819	36.88	154	47.396	59.66	36
30.0	45.363	40.98	103	48.262	26.57	7	38.975	35.47	141	47.520	59.47	19
June 9.0	45.519	42.17	119	48.434	26.83	26	39.193	34.26	121	47.693	59.43	4
18.9	45.714	43.46	129	48.647	27.24	41	39.466	33.26	100	47.907	59.57	14
28.9	45.941	44.84	138	48.896	27.81	57	39.787	32.52	78	48.159	59.88	31
July 8.9	46.197	46.27	143	49.173	28.53	72	40.148	32.04	48	48.440	60.35	47
18.8	46.473	47.71	144	49.473	29.35	82	40.540	31.85	19	48.747	60.97	62
28.8	46.765	49.10	139	49.788	30.27	92	40.954	31.92	7	49.070	61.71	74
Aug. 7.8	47.065	50.41	131	50.112	31.25	98	41.381	32.25	33	49.402	62.54	83
17.8	47.367	51.57	116	50.439	32.24	99	41.814	32.83	58	49.739	63.43	89
27.7	47.667	52.58	101	50.763	33.22	98	42.245	33.65	82	50.074	64.35	92
Sept. 6.7	47.959	53.37	79	51.079	34.16	94	42.667	34.66	101	50.402	65.26	91
16.7	48.239	53.94	57	51.382	35.03	87	43.076	35.87	121	50.718	66.16	90
26.7	48.503	54.26	32	51.670	35.81	78	43.464	37.22	135	51.018	67.02	86
Oct. 6.6	48.750	54.35	9	51.939	36.49	68	43.827	38.70	148	51.301	67.82	80
16.6	48.976	54.20	15	52.186	37.07	58	44.163	40.30	160	51.561	68.54	72
26.6	49.178	53.85	85	52.408	37.55	48	44.465	41.98	168	51.798	69.21	67
Nov. 5.5	49.354	53.33	52	52.604	37.94	39	44.730	43.71	173	52.007	69.81	60
15.5	49.503	52.65	28	52.769	38.23	29	44.952	45.47	176	52.183	70.34	53
25.5	49.620	51.87	117	52.902	38.44	21	45.126	47.22	175	52.327	70.82	48
Dec. 5.5	49.703	51.04	83	52.999	38.60	16	45.249	48.92	170	52.433	71.23	41
15.4	49.751	50.18	86	53.057	38.69	9	45.317	50.53	161	52.499	71.58	35
25.4	49.761	49.33	85	53.074	38.72	3	45.327	52.00	147	52.522	71.87	29
35.4	49.734	48.53	80	53.051	38.70	2	45.279	53.29	129	52.503	72.07	20
Mean Place	44.381	35.51		47.139	21.96		37.844	31.39		46.378	55.08	
Ser δ, Tan δ	1.005	+0.101		1.077	+0.401		1.480	+1.091		1.115	+0.494	
D _ψ α, D _ω α	+0.06	0.00		+0.07	-0.01		+0.09	-0.04		+0.07	-0.02	
D _ψ δ, D _ω δ	+0.2	+0.9		+0.2	+0.9		+0.2	+0.9		+0.2	+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α^1 Eridani. Mag. 4.1		μ Tauri. Mag. 4.3		α Horologii. Mag. 3.8		α Reticuli. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 7	° ' " - 7 2	h m 4 11	° ' " + 8 41	h m 4 11	° ' " -42 29	h m 4 13	° ' " -62 40
	s	"	s	"	s	"	s	"
Jan. 0.4	50.851	68.69	3.707	13.26	17.286	59.52	23.87	58.91
10.4	50.801	70.00 ¹³¹	3.667 ⁴⁰	12.60 ⁶⁶	17.150 ¹³⁶	61.84 ²³²	23.57 ³⁰	61.38 ²⁴⁷
20.3	50.715	71.13 ¹¹³	3.594 ⁷³	11.99 ⁶¹	16.972 ¹⁷⁸	63.75 ¹⁹¹	23.20 ³⁷	63.36 ¹⁹⁸
30.3	50.598	72.07 ⁹⁴	3.488 ¹⁰⁶	11.43 ⁵⁶	16.757 ²¹⁵	65.21 ¹⁴⁶	22.79 ⁴¹	64.83 ¹⁴⁷
Feb. 9.3	50.457	72.79 ⁷²	3.355 ¹³³	10.93 ⁵⁰	16.514 ²⁴³	66.19 ⁹⁸	22.33 ⁴⁶	65.73 ⁹⁰
19.3	50.296	73.29 ⁵⁰	3.202 ¹⁵³	10.51 ⁴²	16.251 ²⁶³	66.66 ⁴⁷	21.85 ⁴⁸	66.07 ³⁴
Mar. 1.2	50.127	73.55 ²⁶	3.038 ¹⁶⁴	10.16 ³⁵	15.980 ²⁷¹	66.63 ³	21.36 ⁴⁹	65.84 ²³
11.2	49.958	73.58 ³	2.875 ¹⁶³	9.88 ²⁸	15.711 ²⁶⁹	66.11 ⁵²	20.88 ⁴⁸	65.06 ⁷⁸
21.2	49.799	73.36 ²²	2.721 ¹⁵⁴	9.71 ¹⁷	15.455 ²⁵⁶	65.11 ¹⁰⁰	20.42 ⁴⁶	63.76 ¹³⁰
31.2	49.658	72.91 ⁴⁵	2.585 ¹³⁶	9.64 ⁷	15.222 ²³³	63.66 ¹⁴⁵	19.99 ⁴³	61.97 ¹⁷⁹
Apr. 10.1	49.546	72.21 ⁷⁰	2.478 ¹⁰⁷	9.69 ⁵	15.023 ¹⁹⁹	61.82 ¹⁸⁴	19.61 ³⁸	59.75 ²²²
20.1	49.468	71.28 ⁹³	2.406 ⁷²	9.89 ²⁰	14.865 ¹⁵⁸	59.59 ²²³	19.29 ³²	57.14 ²⁶¹
30.1	49.430	70.11 ¹¹⁷	2.375 ³¹	10.23 ³⁴	14.755 ¹¹⁰	57.03 ²⁵⁶	19.06 ²³	54.19 ²⁹⁵
May 10.0	49.435	68.75 ¹³⁶	2.388 ¹³	10.73 ⁵⁰	14.697 ⁵⁰	54.22 ²⁶¹	18.89 ¹⁷	51.00 ³¹⁹
20.0	49.485	67.19 ¹⁵⁶	2.447 ⁵⁹	11.40 ⁶⁷	14.696 ¹	51.20 ³⁰²	18.80 ⁹	47.62 ³³⁸
30.0	49.579	65.47 ¹⁷²	2.552 ¹⁰⁵	12.22 ⁸²	14.750 ⁵⁴	48.05 ⁸¹⁵	18.80 ⁰	44.13 ³⁴⁹
June 9.0	49.717	63.63 ¹⁸⁴	2.699 ¹⁴⁷	13.19 ⁹⁷	14.859 ¹⁰⁹	44.85 ³²⁰	18.88 ⁸	40.62 ³⁵¹
18.9	49.894	61.72 ¹⁹¹	2.885 ¹⁸⁶	14.28 ¹⁰⁹	15.020 ¹⁶¹	41.66 ³¹⁹	19.05 ¹⁷	37.17 ³⁴⁵
28.9	50.106	59.77 ¹⁹⁵	3.107 ²²²	15.48 ¹²⁰	15.230 ²¹⁰	38.59 ³⁰⁷	19.30 ²⁵	33.87 ³³⁰
July 8.9	50.346	57.84 ¹⁹³	3.358 ²⁵¹	16.74 ¹²⁶	15.482 ²⁵²	35.70 ²⁸⁹	19.62 ³²	30.83 ³⁰⁴
18.9	50.610	56.00 ¹⁸⁴	3.631 ²⁷³	18.01 ¹²⁷	15.769 ²⁸⁷	33.08 ²⁶²	20.00 ³⁸	28.11 ²⁷²
28.8	50.890	54.30 ¹⁷⁰	3.920 ²⁸⁹	19.27 ¹²⁶	16.085 ⁸¹⁶	30.81 ²²⁷	20.42 ⁴²	25.80 ²⁸¹
Aug. 7.8	51.181	52.79 ¹⁵¹	4.219 ²⁹⁹	20.46 ¹¹⁹	16.421 ³³⁶	28.97 ¹⁸⁴	20.89 ⁴⁷	23.98 ¹⁸²
17.8	51.477	51.53 ¹²⁶	4.524 ³⁰⁵	21.56 ¹¹⁰	16.770 ³⁴⁹	27.61 ¹³⁶	21.39 ⁵⁰	22.71 ¹²⁷
27.7	51.771	50.55 ⁹⁸	4.827 ³⁰³	22.52 ⁹⁶	17.123 ³⁵³	26.79 ⁸²	21.90 ⁵¹	22.04 ⁶⁷
Sept. 6.7	52.060	49.91 ⁶⁴	5.124 ²⁹⁷	23.30 ⁷⁸	17.471 ³⁴⁸	26.54 ²⁵	22.41 ⁵¹	22.00 ⁴
16.7	52.339	49.61 ³⁰	5.411 ²⁸⁷	23.89 ⁵⁹	17.808 ³³⁷	26.87 ³³	22.90 ⁴⁹	22.59 ⁵⁹
26.7	52.602	49.65 ⁴	5.685 ²⁷⁴	24.26 ³⁷	18.127 ³¹⁹	27.79 ⁹²	23.37 ⁴⁷	23.80 ¹²¹
Oct. 6.6	52.849	50.05 ⁴⁰	5.941 ²⁵⁶	24.41 ¹⁵	18.421 ²⁹⁴	29.25 ¹⁴⁶	23.80 ⁴³	25.60 ¹⁸⁰
16.6	53.076	50.77 ⁷²	6.179 ²³⁸	24.36 ⁵	18.684 ²⁶³	31.21 ¹⁹⁶	24.17 ³⁷	27.94 ²³⁴
26.6	53.278	51.77 ¹⁰⁰	6.393 ²¹⁴	24.11 ²⁵	18.909 ²²⁵	33.60 ²³⁹	24.17 ³⁰	30.73 ²⁷⁹
Nov. 5.6	53.454	53.03 ¹²⁶	6.584 ¹⁹¹	23.70 ⁴¹	19.095 ¹⁸⁶	36.34 ²⁷⁴	24.47 ²⁴	33.73 ³¹⁴
15.5	53.602	54.45 ¹⁴²	6.745 ¹⁶¹	23.16 ⁵⁴	19.235 ¹⁴⁰	39.33 ²⁹⁹	24.71 ¹⁵	33.87 ³³⁶
25.5	53.717	56.00 ¹¹⁵	6.876 ¹³¹	22.53 ⁶³	19.326 ⁹¹	42.44 ³¹¹	24.86 ⁸	37.23 ³⁵⁰
Dec. 5.5	53.798	57.60 ⁸¹	6.974 ⁹⁸	21.83 ⁷⁰	19.368 ⁴²	45.57 ³¹³	24.94 ¹	40.73 ³⁴⁶
15.4	53.844	59.19 ⁴⁶	7.035 ⁶¹	21.11 ⁷²	19.358 ¹⁰	48.59 ³⁰²	24.93 ¹⁰	44.19 ³³³
25.4	53.852	60.72 ⁸	7.058 ²³	20.38 ⁷³	19.298 ⁶⁰	51.43 ²⁸⁴	24.83 ¹⁸	47.52 ³⁰⁸
35.4	53.821	62.14 ³¹	7.042 ¹⁶	19.67 ⁷¹	19.189 ¹⁰⁹	53.98 ²⁵⁵	24.65 ²⁸	50.60 ³⁰⁸
							24.37 ²⁸	53.34 ²⁷⁴
Mean Place	48.789	71.25	1.544	7.40	15.072	55.70	21.071	53.00
Sec δ , Tan δ	1.008	-0.124	1.012	+0.153	1.356	-0.916	2.179	-1.936
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.06	0.00	+0.04	+0.03	+0.02	+0.06
$D\psi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♉ Tauri. Mag. 3.9		♉ Tauri. Mag. 3.9		♊ Eridani. Mag. 4.1		♋ Mensæ. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 15	° ' " +15 25	h m 4 18	° ' " +17 20	h m 4 30	° ' " -34 12	h m 4 23	° ' " -80 24
Jan. 0.4	6.319	48.46	11.035	63.11	57.291	34.94	38.89	39.97
10.4	6.287	48.11	11.005	62.86	57.197	37.19	37.87	42.38
20.8	6.216	47.78	10.935	62.59	57.062	39.08	36.67	44.32
30.3	6.111	47.40	10.830	62.30	56.880	40.57	35.35	45.74
Feb. 9.3	5.977	47.04	10.696	61.99	56.689	41.62	33.93	46.60
19.3	5.822	46.67	10.540	61.65	56.469	42.22	32.46	46.91
Mar. 1.2	5.656	46.31	10.371	61.29	56.237	42.37	30.96	46.67
11.2	5.488	45.95	10.201	60.92	56.006	42.07	29.49	45.86
21.2	5.330	45.62	10.040	60.55	55.782	41.32	28.06	44.55
31.2	5.190	45.34	9.898	60.21	55.579	40.16	26.73	42.78
Apr. 10.1	5.080	45.13	9.785	59.92	55.404	38.60	25.53	40.56
20.1	5.006	45.00	9.708	59.71	55.267	36.69	24.48	37.98
30.1	4.973	44.99	9.673	59.59	55.172	34.46	23.60	35.11
May 10.0	4.985	45.10	9.684	59.60	55.126	31.95	22.91	31.96
20.0	5.045	45.37	9.742	59.74	55.130	29.24	22.42	28.65
30.0	5.151	45.78	9.847	60.04	55.184	26.38	22.15	25.25
June 9.0	5.302	46.35	9.997	60.48	55.288	23.42	22.13	21.83
18.9	5.494	47.06	10.187	61.07	55.440	20.45	22.32	18.47
28.9	5.721	47.83	10.414	61.79	55.635	17.54	22.72	15.28
July 8.9	5.978	48.81	10.672	62.61	55.867	14.77	23.33	12.29
18.9	6.257	49.81	10.952	63.51	56.183	12.24	24.13	9.69
28.8	6.554	50.83	11.251	64.46	56.423	10.00	25.08	7.48
Aug. 7.8	6.863	51.86	11.561	65.42	56.733	8.12	26.18	5.74
17.8	7.175	52.85	11.876	66.36	57.054	6.60	27.38	4.55
27.7	7.487	53.76	12.191	67.24	57.379	5.75	28.63	3.93
Sept. 6.7	7.792	54.57	12.501	68.04	57.702	5.38	29.91	3.94
16.7	8.090	55.23	12.801	68.71	58.015	5.45	31.16	4.57
26.7	8.374	55.75	13.090	69.26	58.314	6.11	32.35	5.82
Oct. 6.6	8.641	56.13	13.363	69.68	58.593	7.30	33.43	7.64
16.6	8.889	56.34	13.616	69.95	58.846	8.98	34.37	10.00
26.6	9.116	56.42	13.848	70.11	59.068	11.08	35.12	12.78
Nov. 5.6	9.317	56.36	14.065	70.15	59.258	13.53	35.66	15.92
15.5	9.490	56.22	14.234	70.10	59.409	16.23	35.96	19.28
25.5	9.632	55.97	14.381	69.98	59.519	19.07	36.02	22.73
Dec. 5.5	9.739	55.68	14.494	69.80	59.586	21.97	35.82	26.19
15.4	9.809	55.36	14.568	69.59	59.606	24.81	35.38	29.48
25.4	9.839	55.01	14.601	69.34	59.581	27.50	34.69	32.54
35.4	9.829	54.65	14.594	69.06	59.510	29.94	33.79	35.25
Mean Place	4.077	41.32	8.755	55.71	55.139	32.57	32.981	83.81
Sec δ, Tan δ	1.037	+0.276	1.048	+0.312	1.209	-0.680	6.001	-5.917
Dψ α, Dω α	+0.07	-0.01	+0.07	-0.01	+0.04	+0.02	-0.08	+0.16
Dψ δ, Dω δ	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Tauri. Mag. 3.6		m Persei. Mag. 6.1		α Tauri. (Aldebaran.) Mag. 1.1		γ Eridani. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 23	° ' " +18 59	h m 4 27	° ' " +42 53	h m 4 31	° ' " +16 20	h m 4 32	° ' " - 3 30
Jan. 0.4	48.409	57.91	37.138	27.48	11.674	42.95	12.385	73.50
10.4	48.383	57.74	37.099	28.52	11.655	42.65	12.355	74.76
20.4	48.317	57.55	37.006	29.38	11.594	42.34	12.287	75.86
30.3	48.214	57.31	36.865	29.99	11.497	42.03	12.186	76.80
Feb. 9.3	48.081	57.05	36.684	30.34	11.367	41.71	12.054	77.55
19.3	47.925	56.75	36.474	30.42	11.215	41.39	11.900	78.11
Mar. 1.2	47.754	56.40	36.248	30.20	11.046	41.06	11.731	78.47
11.2	47.581	56.03	36.018	29.71	10.874	40.73	11.560	78.61
21.2	47.417	55.65	35.799	28.94	10.710	40.41	11.395	78.55
31.2	47.271	55.28	35.603	27.96	10.561	40.12	11.244	78.27
Apr. 10.1	47.153	54.93	35.443	26.79	10.440	39.90	11.119	77.79
20.1	47.071	54.64	35.329	25.51	10.353	39.73	11.025	77.08
30.1	47.031	54.45	35.268	24.16	10.306	39.66	10.969	76.18
May 10.1	47.037	54.36	35.267	22.79	10.305	39.70	10.956	75.07
20.0	47.090	54.40	35.325	21.47	10.350	39.88	10.987	73.78
30.0	47.191	54.58	35.443	20.26	10.441	40.20	11.063	72.33
June 9.0	47.338	54.91	35.618	19.18	10.578	40.65	11.181	70.75
18.9	47.525	55.37	35.846	18.28	10.756	41.23	11.339	69.06
28.9	47.750	55.97	36.122	17.58	10.971	41.94	11.532	67.34
July 8.9	48.006	56.69	36.438	17.09	11.217	42.74	11.757	65.61
18.9	48.286	57.49	36.786	16.83	11.488	43.61	12.008	63.94
28.8	48.586	58.35	37.159	16.79	11.778	44.51	12.277	62.37
Aug. 7.8	48.896	59.23	37.549	16.97	12.082	45.42	12.560	60.95
17.8	49.213	60.10	37.949	17.34	12.392	46.29	12.851	59.74
27.8	49.531	60.94	38.351	17.89	12.705	47.10	13.144	58.78
Sept. 6.7	49.845	61.70	38.748	18.62	13.015	47.90	13.436	58.12
16.7	50.150	62.36	39.138	19.49	13.317	48.39	13.721	57.77
26.7	50.444	62.91	39.515	20.48	13.609	48.84	13.994	57.74
Oct. 6.6	50.723	63.35	39.872	21.58	13.887	49.15	14.254	58.04
16.6	50.983	63.67	40.208	22.77	14.148	49.31	14.498	58.65
26.6	51.222	63.87	40.517	24.03	14.389	49.34	14.722	59.53
Nov. 5.6	51.436	63.97	40.794	25.36	14.606	49.26	14.921	60.65
15.5	51.624	63.99	41.034	26.72	14.797	49.09	15.093	61.94
25.5	51.778	63.95	41.232	28.10	14.956	48.85	15.236	63.36
Dec. 5.5	51.897	63.86	41.383	29.47	15.080	48.56	15.344	64.84
15.5	51.978	63.74	41.483	30.80	15.166	48.25	15.415	66.33
25.4	52.018	63.59	41.528	32.05	15.213	47.93	15.447	67.78
35.4	52.015	63.42	41.519	33.17	15.216	47.61	15.440	69.12
Mean Place	46.086	50.43	34.256	15.99	9.358	36.31	10.231	76.42
Sec δ , Tan δ	1.058	+0.344	1.365	+0.929	1.042	+0.293	1.002	-0.061
$D\psi\alpha$, $D\omega\alpha$	+0.07	-0.01	+0.08	-0.02	+0.07	-0.01	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	+0.2	+0.9	+0.2	+0.9	+0.2	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Doradus. Mag. 3.5		δ Eridani. Mag. 4.0		τ Tauri. Mag. 4.3		Groombridge 848. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 32	° ' " -55 12	h m 4 34	° ' " -14 27	h m 4 37	° ' " +22 47	h m 4 37	° ' " +75 47
	s	"	s	"	s	"	s	"
Jan. 0.4	14.670	63.39	24.776	54.47	18.124	62.86	45.55	46.56
10.4	14.475 ¹⁹⁵	66.05 ²⁶⁶	24.736 ⁴⁰	56.19 ¹⁷²	18.110 ¹⁴	62.89 ³	45.29 ²⁶	49.08 ²⁵²
20.4	14.223 ²⁵²	68.27 ²²³	24.656 ⁸⁰	57.69 ¹⁵⁰	18.051 ⁵⁹	62.88 ¹	44.88 ⁴¹	51.26 ²¹⁸
30.3	13.922 ³⁰¹	70.01 ¹⁷⁴	24.541 ¹¹⁵	58.93 ¹²⁴	17.954 ⁹⁷	62.81 ⁷	44.33 ⁵⁵	53.03 ¹⁷⁷
Feb. 9.3	13.583 ³³⁹	71.24 ¹²³	24.397 ¹⁴⁴	59.90 ⁹⁷	17.822 ¹³²	62.68 ¹³	43.68 ⁶⁵	54.31 ¹²⁸
	366	67	167	66	159	21	75	75
19.3	13.217	71.91	24.230	60.56	17.663	62.47	42.93	55.06
Mar. 1.3	12.836 ³³¹	72.04 ¹³	24.050 ¹⁸⁰	60.92 ³⁶	17.489 ¹⁷⁴	62.20 ²⁷	42.15 ⁷⁸	55.24 ¹⁸
11.2	12.454 ³⁸²	71.63 ⁴¹	23.865 ¹⁸⁵	60.97 ⁵	17.310 ¹⁷⁹	61.86 ³⁴	41.36 ⁷⁹	54.86 ³⁸
21.2	12.084 ³⁷⁰	70.68 ⁹⁵	23.687 ¹⁷⁸	60.71 ²⁶	17.136 ¹⁷⁴	61.46 ⁴⁰	40.60 ⁷⁶	53.94 ⁹²
31.2	11.740 ³⁴⁴	69.24 ¹⁴⁴	23.524 ¹⁶³	60.16 ⁵⁵	16.980 ¹⁵⁶	61.02 ⁴⁴	39.92 ⁶⁸	52.50 ¹⁴⁴
	307	188	140	85	130	45	60	185
Apr. 10.1	11.433	67.36	23.384	59.31	16.850	60.57	39.32	50.65
20.1	11.172 ²⁶¹	65.05 ²³¹	23.278 ¹⁰⁶	58.18 ¹¹³	16.755 ⁹⁵	60.14 ⁴³	38.85 ⁴⁷	48.42 ²²³
30.1	10.967 ²⁰⁶	62.39 ²⁶⁶	23.210 ⁶⁸	56.79 ¹³⁹	16.703 ⁵²	59.75 ³⁹	38.53 ³²	45.92 ²⁵⁰
May 10.1	10.826 ¹⁴¹	59.43 ²⁶⁶	23.183 ²⁷	55.16 ¹⁶³	16.697 ⁶	59.45 ³⁰	38.37 ¹⁶	43.26 ²⁶⁶
20.0	10.751 ⁷⁵	56.25 ³¹⁸	23.201 ¹⁸	53.33 ¹⁸³	16.739 ⁴²	59.26 ¹⁹	38.37 ⁰	40.50 ²⁷⁶
	5	334	64	199	90	9	18	275
30.0	10.746	52.91	23.265	51.34	16.829	59.17	38.55	37.75
June 9.0	10.809 ⁶³	49.50 ³⁴¹	23.372 ¹⁰⁷	49.21 ²¹³	16.966 ¹³⁷	59.23 ⁶	38.88 ³³	35.09 ²⁶⁶
19.0	10.941 ¹³²	46.10 ³⁴⁰	23.520 ¹⁴⁸	47.00 ²²¹	17.147 ¹⁸¹	59.43 ²⁰	39.36 ⁴⁸	32.60 ²⁴⁹
28.9	11.138 ¹⁹⁷	42.80 ³³⁰	23.705 ¹⁸⁵	44.79 ²²¹	17.366 ²¹⁹	59.75 ³²	39.99 ⁶³	30.34 ²²⁶
July 8.9	11.392 ²⁵⁴	39.70 ³¹⁰	23.923 ²¹⁸	42.62 ²¹⁷	17.618 ²⁵²	60.19 ⁴⁴	40.75 ⁷⁶	28.37 ¹⁹⁷
	306	264	244	205	278	55	86	162
18.9	11.698	36.86	24.167	40.57	17.896	60.74	41.61	26.75
28.8	12.049 ³⁵¹	34.40 ²⁴⁶	24.434 ²⁶⁷	38.69 ¹⁸⁸	18.196 ³⁰⁰	61.37 ⁶³	42.55 ⁹⁴	25.50 ¹²⁵
Aug. 7.8	12.433 ³⁸⁴	32.38 ²⁰²	24.715 ²⁸¹	37.06 ¹⁶³	18.509 ³¹³	62.06 ⁶⁹	43.56 ¹⁰¹	24.64 ⁸⁶
17.8	12.842 ⁴⁰⁹	30.88 ¹⁵⁰	25.006 ²⁹¹	35.70 ¹³⁶	18.830 ³²¹	62.76 ⁷⁰	44.62 ¹⁰⁶	24.19 ⁴⁵
27.8	13.266 ⁴²⁴	29.95 ⁹³	25.301 ²⁹⁵	34.70 ¹⁰⁰	19.155 ³²⁵	63.46 ⁷⁰	45.71 ¹⁰⁹	24.16 ³
	427	33	283	61	323	67	109	39
Sept. 6.7	13.693	29.62	25.594	34.09	19.478	64.13	46.80	24.55
16.7	14.114 ⁴²¹	29.91 ²⁹	25.882 ²⁸⁸	33.88 ²¹	19.795 ³¹⁷	64.75 ⁶²	47.88 ¹⁰⁸	25.35 ⁸⁰
26.7	14.516 ⁴⁰²	30.85 ⁹⁴	26.158 ²⁷⁶	34.09 ²¹	20.101 ³⁰⁶	65.29 ⁵⁴	48.94 ¹⁰⁶	26.55 ¹²⁰
Oct. 6.7	14.891 ³⁷⁵	32.38 ¹⁵³	26.419 ²⁶¹	34.72 ⁶³	20.395 ²⁹⁴	65.76 ⁴⁷	49.94 ¹⁰⁰	28.12 ¹⁵⁷
16.6	15.228 ³³⁷	34.46 ²⁰⁸	26.664 ²⁴⁵	35.73 ¹⁰¹	20.672 ²⁷⁷	66.14 ³⁸	50.88 ⁹⁴	30.03 ¹⁹¹
	262	257	223	134	256	80	85	223
26.6	15.520	37.03	26.887	37.07	20.928	66.44	51.73	32.26
Nov. 5.6	15.757 ²³⁷	40.00 ²⁹⁷	27.084 ¹⁹⁷	38.72 ¹⁶⁵	21.161 ²³³	66.67 ²⁸	52.47 ⁷⁴	34.76 ²⁵⁰
15.5	15.936 ¹⁷⁹	43.24 ³²⁴	27.252 ¹⁶⁸	40.59 ¹⁸⁷	21.366 ²⁰⁵	66.85 ¹⁸	53.11 ⁶⁴	37.48 ²⁷²
25.5	16.050 ¹¹⁴	46.65 ³⁴¹	27.389 ¹³⁷	42.60 ²⁰¹	21.539 ¹⁷³	66.99 ¹⁴	53.60 ⁴⁹	40.35 ²⁸⁷
Dec. 5.5	16.096 ⁴⁶	50.11 ³⁴⁶	27.490 ¹⁰¹	44.68 ²⁰⁸	21.677 ¹³⁸	67.09 ¹⁰	53.94 ³⁴	43.30 ²⁹⁵
	23	338	63	208	97	9	17	295
15.5	16.073	53.49	27.553	46.76	21.774	67.18	54.11	46.25
25.4	15.980 ⁹³	56.69 ³²⁰	27.575 ²²	48.76 ²⁰⁰	21.828 ⁵⁴	67.24 ⁶	54.12 ¹	49.11 ²⁸⁶
35.4	15.822 ¹⁵⁸	59.58 ²⁸⁹	27.556 ¹⁹	50.62 ¹⁸⁶	21.838 ¹⁰	67.27 ³	53.97 ¹⁵	51.79 ²⁶⁸
Mean Place	12.109	58.87	22.647	55.42	15.692	55.34	38.363	32.16
Sec δ , Tan δ	1.753	-1.440	1.033	-0.258	1.085	+0.420	4.075	+3.951
D ψ α , D ω α	+0.03	+0.03	+0.05	+0.01	+0.07	-0.01	+0.16	-0.09
D ψ δ , D ω δ	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Coell. Mag. 4.5		γ Camelop. Mag. 5.4		μ Eridani. Mag. 4.2		π^3 Orionis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 37	° ' " -42 0	h m 4 41	° ' " +56 36	h m 4 41	° ' " - 3 24	h m 4 45	° ' " + 6 49
	s	"	s	"	s	"	s	"
Jan. 0.4	55.410	82.29	8.713	52.63	23.270	18.33	22.242	7.15
10.4	55.301 ¹⁰⁹	84.84 ²⁵⁵	8.655 ⁵⁸	54.39 ¹⁷⁶	23.249 ²¹	19.61 ¹²⁸	22.232 ¹⁰	6.35 ⁸⁰
20.4	55.144 ¹⁵⁷	87.02 ²¹⁸	8.525 ¹³⁰	55.89 ¹⁵⁰	23.187 ⁶²	20.75 ¹¹⁴	22.182 ⁵⁰	5.63 ⁷²
30.3	54.946 ¹⁹⁸	88.77 ¹⁷⁵	8.329 ¹⁹⁶	57.08 ¹¹⁹	23.090 ⁹⁷	21.72 ⁹⁷	22.093 ⁸⁹	5.00 ⁶³
Feb. 9.3	54.715 ²³¹	90.05 ¹²⁸	8.079 ²⁵⁰	57.92 ⁸⁴	22.962 ¹²⁸	22.48 ⁷⁶	21.972 ¹²¹	4.45 ⁵⁵
	257	79	292	44	152	59	146	44
19.3	54.458	90.84	7.787	58.36	22.810	23.07	21.826	4.01
Mar. 1.3	54.187	91.13	7.471	58.40	22.642	23.44	21.663	3.67
	275	21	324	39	172	17	168	24
11.2	53.912	90.92	7.147	58.01	22.470	23.61	21.495	3.43
21.2	53.645 ²⁶⁷	90.23 ⁶⁹	6.836 ³¹¹	57.23 ⁷⁸	22.303 ¹⁶⁷	23.58 ⁸	21.331 ¹⁶⁴	3.30 ¹³
31.2	53.397 ²⁴⁸	89.08 ¹¹⁵	6.551 ²⁸⁵	56.08 ¹¹⁵	22.149 ¹⁵⁴	23.32 ²⁶	21.179 ¹⁵²	3.29 ¹
	221	159	240	145	131	45	127	10
Apr. 10.1	53.176 ¹⁸³	87.49 ¹⁹⁷	6.311 ¹⁸²	54.63 ¹⁷⁰	22.018 ¹⁰¹	22.87 ⁶⁸	21.052 ⁹⁷	3.89 ²⁶
20.1	52.993 ¹³⁸	85.52 ²³²	6.129 ¹¹⁵	52.93 ¹⁸⁷	21.917 ⁶²	22.19 ⁶⁷	20.955 ⁵⁹	3.65 ²⁶
30.1	52.855 ⁸⁸	83.20 ²⁶³	6.014 ⁴¹	51.06 ¹⁹⁷	21.855 ²²	21.32 ¹⁰⁷	20.896 ¹⁷	4.04 ³⁹
May 10.1	52.767 ³⁵	80.57 ²⁸⁷	5.973 ³⁸	49.09 ²⁰⁰	21.833 ²²	20.25 ¹²⁶	20.879 ²⁷	4.56 ⁵⁴
20.0	52.732 ²¹	77.70 ³⁰⁵	6.011 ¹¹⁵	47.09 ¹⁹⁶	21.855 ⁶⁸	18.99 ¹⁴¹	20.906 ⁷²	5.28 ⁷⁰
								83
30.0	52.753	74.65	6.126	45.13	21.923	17.58	20.978	6.11
June 9.0	52.829 ⁷⁶	71.52 ³¹³	6.317 ¹⁹¹	43.28 ¹⁸⁵	22.033 ¹¹⁰	16.04 ¹⁵⁴	21.093 ¹¹⁵	7.08 ⁹⁷
19.0	52.958 ¹²⁹	68.36 ³¹⁶	6.577 ²⁸⁰	41.59 ¹⁶⁹	22.183 ¹⁵⁶	14.39 ¹⁶⁵	21.249 ¹⁵⁶	8.15 ¹⁰⁷
28.9	53.136 ¹⁷⁸	65.25 ³¹¹	6.903 ³²⁶	40.10 ¹⁴⁹	22.369 ¹⁸⁶	12.69 ¹⁷⁰	21.441 ¹⁹²	9.32 ¹¹⁷
July 8.9	53.358 ²²²	62.30 ²⁶⁶	7.283 ³⁸⁰	38.86 ¹²⁴	22.587 ²¹⁸	10.98 ¹⁷¹	21.666 ²²⁶	10.52 ¹²⁰
	262	273	426	98	244	164	250	122
18.9	53.620	59.57	7.709	37.88	22.831	9.34	21.916	11.74
28.8	53.914 ²⁹⁴	57.16 ²⁴¹	8.171 ⁴⁶²	37.20 ⁶⁸	23.096 ²⁶⁵	7.79 ¹⁵⁵	22.187 ²⁷¹	12.93 ¹¹⁹
Aug. 7.8	54.233 ³¹⁹	55.15 ²⁰¹	8.662 ⁴⁰¹	36.80 ⁴⁰	23.375 ²⁷⁹	6.39 ¹⁴⁰	22.473 ²⁸⁶	14.04 ¹¹¹
17.8	54.569 ³³⁶	53.59 ¹⁵⁶	9.170 ⁵⁰⁸	36.70 ¹⁰	23.664 ²⁸⁹	5.20 ¹¹⁹	22.768 ²⁸⁶	15.04 ¹⁰⁰
27.8	54.914 ³⁴⁵	52.54 ¹⁰⁶	9.687 ⁵¹⁷	36.90 ²⁰	23.956 ²⁹²	4.24 ⁹⁸	23.067 ²⁹⁹	15.88 ⁸⁴
	348	48	518	47	292	65	298	65
Sept. 6.7	55.262	52.06	10.205	37.37	24.248	3.59	23.365	16.53
16.7	55.605 ³⁴³	52.16 ¹⁰	10.717 ⁵¹²	38.12 ⁷⁵	24.535 ²⁸⁷	3.25 ⁸⁴	23.659 ²⁹⁴	16.97 ⁴⁴
26.7	55.936 ³³¹	52.85 ⁶⁹	11.214 ⁴⁹⁷	39.11 ⁹⁹	24.813 ²⁷⁸	3.22 ³	23.945 ²⁸⁶	17.17 ²⁰
Oct. 6.7	56.246 ³¹⁰	54.11 ¹⁸⁶	11.691 ⁴⁷⁷	40.35 ¹²⁴	25.078 ²⁶⁶	3.52 ⁸⁰	24.219 ²⁷⁴	17.15 ²
16.6	56.530 ²⁸⁴	55.91 ¹⁸⁰	12.141 ⁴⁵⁰	41.80 ¹⁴⁵	25.327 ²⁴⁹	4.14 ⁶³	24.477 ²⁵⁸	16.89 ²⁶
	262	227	415	165	280	99	241	45
26.6	56.782	58.18	12.556	43.45	25.557	5.03	24.718	16.44
Nov. 5.6	56.996 ²¹⁴	60.83 ²⁶⁶	12.930 ³⁷⁴	45.26 ¹⁸¹	25.763 ²⁰⁶	6.16 ¹¹³	24.936 ²¹⁸	15.81 ⁶³
15.5	57.169 ¹⁷³	63.78 ²⁰⁶	13.255 ³²⁶	47.20 ¹⁹⁴	25.944 ¹⁸¹	7.47 ¹³¹	25.130 ¹⁹⁴	15.04 ⁷⁷
25.5	57.295 ¹⁸⁶	66.92 ³¹⁴	13.523 ²⁹⁸	49.23 ²⁰⁸	26.094 ¹⁵⁰	8.91 ¹⁴⁴	25.293 ¹⁶³	14.18 ⁸⁶
Dec. 5.5	57.371 ⁷⁶	70.12 ³³⁰	13.728 ²⁰⁶	51.32 ²⁰⁰	26.211 ¹¹⁷	10.41 ¹⁵⁰	25.423 ¹³⁰	13.28 ⁹²
	25	315	184	207	80	152	94	93
15.5	57.396	73.27	13.862	53.39	26.291	11.93	25.517	12.33
25.4	57.368 ²⁸	76.27 ³⁰⁰	13.923 ⁶¹	55.39 ²⁰⁰	26.332 ⁴¹	13.40 ¹⁴⁷	25.571 ⁵⁴	11.43 ⁹⁰
35.4	57.288 ⁸⁰	79.04 ²⁷⁷	13.907 ¹⁶	57.25 ¹⁸⁶	26.333 ¹	14.77 ¹³⁷	25.588 ¹²	10.57 ⁸⁶
Mean Place	53.125	79.29	5.010	40.34	21.091	21.10	19.982	2.75
Sec δ , Tan δ	1.346	-0.901	1.817	+1.517	1.002	-0.059	1.007	+0.120
$D\psi\alpha$, $D_\omega\alpha$	+0.04	+0.02	+0.10	-0.03	+0.06	0.00	+0.06	0.00
$D\psi\delta$, $D_\omega\delta$	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9	+0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	9 Camelop. Mag. 4.4		ι Tauri. Mag. 5.1		π ⁵ Orionis. Mag. 3.9		ι Aurigæ. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 45	° ' " +66 12	h m 4 46	° ' " +18 41	h m 4 49	° ' " + 2 18	h m 4 51	° ' " +33 2
	s 4	" 12	s 4	" 41	s 4	" 18	s 4	" 2
Jan. 0.4	52.24	25.12	33.414	64.99	57.867	24.34	37.855	17.20
10.4	52.13 11	27.32 280	33.408 6	64.80 19	57.856 11	23.30 104	37.851 4	17.79 59
20.4	51.93 20	29.24 192	33.358 50	64.60 20	57.806 50	22.37 98	37.796 55	18.29 50
30.3	51.65 28	30.80 156	33.268 90	64.40 20	57.717 89	21.57 80	37.696 100	18.67 38
Feb. 9.3	51.29 36	31.94 114	33.142 126	64.18 23	57.595 122	20.92 65	37.557 139	18.89 22
19.3	50.87 42	32.62 68	32.992 150	63.94 24	57.448 147	20.39 53	37.385 172	18.96 7
Mar. 1.3	50.42 45	32.81 19	32.824 168	63.66 28	57.284 164	20.02 37	37.193 192	18.85 11
11.2	49.96 46	32.50 31	32.648 176	63.37 29	57.113 171	19.80 23	36.993 200	18.54 31
21.2	49.52 44	31.72 78	32.475 173	63.06 31	56.946 167	19.73 7	36.797 196	18.08 46
31.2	49.11 41	30.49 128	32.320 158	62.75 31	56.791 155	19.82 9	36.616 181	17.48 60
Apr. 10.2	48.76 35	28.87 162	32.188 132	62.46 29	56.658 138	20.08 26	36.463 153	16.75 73
20.1	48.48 26	26.95 192	32.088 100	62.23 23	56.556 102	20.49 41	36.347 116	15.95 80
30.1	48.29 19	24.78 217	32.080 88	62.05 18	56.491 65	21.08 59	36.276 71	15.11 84
May 10.1	48.21 8	22.46 232	32.015 15	61.97 8	56.467 24	21.85 77	36.254 22	14.28 83
20.0	48.22 1	20.06 240	32.046 31	61.99 2	56.487 20	22.78 98	36.283 29	13.49 79
30.0	48.34 12	17.67 239	32.125 79	62.14 15	56.551 64	23.85 107	36.366 83	12.79 70
June 9.0	48.55 21	15.36 231	32.249 124	62.40 26	56.658 107	25.07 122	36.500 134	12.19 60
19.0	48.88 33	13.21 215	32.414 165	62.79 39	56.805 147	26.38 131	36.681 181	11.72 47
28.9	49.28 40	11.26 195	32.619 205	63.30 51	56.988 183	27.76 138	36.906 225	11.40 32
July 8.9	49.75 47	9.57 169	32.856 237	63.88 58	57.204 216	29.17 141	37.168 263	11.24 16
18.9	50.30 55	8.17 140	33.120 264	64.59 71	57.445 241	30.57 140	37.461 293	11.21 3
28.9	50.90 60	7.11 106	33.406 286	65.32 73	57.709 264	31.91 134	37.778 317	11.33 12
Aug. 7.8	51.53 63	6.39 72	33.707 301	66.06 74	57.987 273	33.13 122	38.113 335	11.58 25
17.8	52.20 67	6.02 37	34.018 311	66.79 73	58.276 289	34.22 109	38.460 347	11.92 34
27.8	52.88 69	6.00 2	34.332 314	67.47 68	58.569 298	35.10 88	38.814 354	12.36 44
Sept. 6.7	53.57 66	6.34 34	34.646 314	68.09 62	58.863 294	35.74 64	39.167 353	12.86 50
16.7	54.25 68	7.03 69	34.957 311	68.60 51	59.154 291	36.13 39	39.516 349	13.41 55
26.7	54.92 67	8.05 102	35.260 306	69.02 42	59.436 282	36.23 10	39.858 342	14.00 59
Oct. 6.7	55.56 64	9.38 133	35.550 290	69.31 29	59.708 272	36.06 17	40.188 330	14.61 61
16.6	56.17 61	11.01 163	35.824 274	69.49 18	59.965 257	35.64 42	40.502 314	15.23 62
26.6	56.72 55	12.89 188	36.083 259	69.54 5	60.205 240	34.97 67	40.796 294	15.88 65
Nov. 5.6	57.22 50	15.02 213	36.316 233	69.51 8	60.422 217	34.10 87	41.065 269	16.54 66
15.5	57.65 43	17.33 231	36.523 207	69.41 10	60.615 193	33.97 103	41.305 240	17.21 67
25.5	58.01 36	19.78 245	36.702 179	69.25 16	60.778 163	31.94 113	41.510 205	17.89 68
Dec. 5.5	58.26 25	22.31 253	36.844 142	69.08 17	60.908 130	30.73 121	41.676 166	18.58 69
15.5	58.42 16	24.85 254	36.948 104	68.88 20	61.002 94	29.51 122	41.798 122	19.27 69
25.4	58.49 7	27.32 247	37.010 62	68.68 20	61.056 54	28.34 117	41.872 74	19.93 66
35.4	58.45 4	29.64 232	37.028 18	68.47 21	61.069 13	27.24 110	41.895 23	20.55 62
Mean Place	47.437	12.27	31.010	58.61	55.628	20.81	35.156	8.90
Sec δ, Tan δ	2.478	+2.268	1.056	+0.338	1.001	+0.040	1.193	+0.650
D _ψ α, D _ω α	+0.12	-0.05	+0.07	-0.01	+0.06	0.00	+0.08	-0.01
D _ψ δ, D _ω δ	+0.1	+0.9	+0.1	+0.9	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Aurigæ. Var. 3.0-4.5		β Camelop. Mag. 4.2		ζ Aurigæ. Mag. 3.9		ι Tauri. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 56	° ' " +43 42	h m 4 56	° ' " +60 19	h m 4 56	° ' " +40 57	h m 4 58	° ' " +21 28
Jan. 0.4	3.684 s	15.55 "	5.82 s	32.43 "	43.363 s	30.47 "	10.491 s	26.63 "
10.4	3.676 8	16.72 117	5.77 5	34.41 106	43.357 6	31.49 102	10.406 5	26.59 4
20.4	3.609 67	17.74 102	5.64 13	36.16 175	43.297 60	32.38 89	10.454 42	26.54 5
30.3	3.489 120	18.57 88	5.44 20	37.61 145	43.185 112	33.09 71	10.370 84	26.47 7
Feb. 9.3	3.322 167 203	19.15 58 32	5.17 27 32	38.69 106 66	43.029 191	33.60 51 27	10.249 121 149	26.36 15
19.3	3.119	19.47 4	4.85	39.37 24	42.838	33.87 2	10.100	26.21
Mar. 1.3	2.892 227	19.51 25	4.49 36	39.61 20	42.622 216	33.89 26	9.929 171	26.01 20
11.2	2.654 233	19.26 53	4.13 36	39.41 64	42.397 225	33.63 50	9.749 180	25.74 27
21.2	2.421 215	18.73 79	3.77 34	38.77 106	42.175 206	33.13 73	9.571 178	25.44 33
31.2	2.206 186	17.94 99	3.43 29	37.72 139	41.970 175	32.40 91	9.408 141	25.11 35
Apr. 10.2	2.020 143	16.95 118	3.14 23	36.33 169	41.795 136	31.49 107	9.267 108	24.76 34
20.1	1.877 91	15.77 128	2.91 16	34.64 191	41.659 88	30.42 117	9.159 69	24.42 29
30.1	1.786 37	14.49 135	2.75 8	32.73 208	41.571 35	29.25 121	9.090 25	24.13 23
May 10.1	1.749 23	13.14 135	2.67 1	30.65 214	41.536 23	28.04 122	9.065 69	23.90 5
20.0	1.772 84	11.79 131	2.68 10	28.51 214	41.559 81	26.82 115	9.087 22	23.75 5
30.0	1.856 143	10.48 121	2.78 18	26.37 207	41.640 137	25.67 107	9.156 116	23.70 7
June 9.0	1.999 197	9.27 109	2.96 25	24.30 194	41.777 191	24.60 94	9.272 159	23.77 19
19.0	2.196 247	8.18 94	3.21 32	22.36 177	41.968 239	23.66 79	9.431 198	23.96 30
28.9	2.443 327	7.24 74	3.53 39	20.59 153	42.207 279	22.87 61	9.629 232	24.26 40
July 8.9	2.734 327	6.50 56	3.92 45	19.06 127	42.486 316	22.26 44	9.861 262	24.66 48
18.9	3.061 357	5.94 36	4.37 49	17.79 100	42.802 344	21.82 25	10.123 283	25.14 54
28.9	3.418 379	5.58 15	4.86 52	16.79 69	43.146 365	21.57 8	10.406 302	25.68 58
Aug. 7.8	3.797 395	5.43 2	5.38 56	16.10 39	43.511 379	21.49 10	10.708 312	26.26 59
17.8	4.192 402	5.45 22	5.94 57	15.71 7	43.890 387	21.59 26	11.020 318	26.85 57
27.8	4.594 405	5.67 37	6.51 57	15.64 24	44.277 389	21.85 39	11.338 320	27.42 52
Sept. 6.7	4.999 402	6.04 53	7.08 57	15.88 53	44.666 387	22.24 52	11.658 318	27.94 45
16.7	5.401 393	6.57 68	7.65 53	16.41 83	45.053 379	22.76 68	11.976 311	28.39 37
26.7	5.794 381	7.25 80	8.20 53	17.24 111	45.432 366	23.39 75	12.287 300	28.76 28
Oct. 6.7	6.175 364	8.06 92	8.73 52	18.35 135	45.798 349	24.14 83	12.587 287	29.04 18
16.6	6.539 340	8.97 102	9.25 47	19.70 160	46.147 328	24.97 91	12.874 270	29.22 12
26.6	6.879 312	9.99 112	9.72 43	21.30 180	46.475 300	25.88 99	13.144 248	29.34 5
Nov. 5.6	7.191 279	11.11 121	10.15 39	23.10 196	46.775 267	26.87 106	13.392 223	29.39 1
15.6	7.470 238	12.32 127	10.54 32	25.08 213	47.042 230	27.93 111	13.615 193	29.38 4
25.5	7.708 191	13.59 131	10.86 25	27.21 220	47.272 186	29.04 114	13.808 158	29.34 5
Dec. 5.5	7.899 138	14.90 123	11.11 17	29.41 224	47.458 136	30.18 116	13.966 118	29.29 6
15.5	8.037 83	16.22 130	11.28 8	31.65 220	47.594 83	31.34 113	14.084 75	29.23 6
25.4	8.120 25	17.52 123	11.36 0	33.85 208	47.677 27	32.47 107	14.159 29	29.17 5
35.4	8.145	18.75	11.36	35.93	47.704	33.54	14.188	29.12
Mean Place	0.620	6.11	1.876	21.09	40.402	21.44	8.007	20.43
Sec δ , Tan δ	1.383	+0.956	2.020	+1.755	1.324	+0.868	1.075	+0.393
$D\psi\alpha$, $D\omega\alpha$	+0.09	-0.02	+0.11	-0.03	+0.08	-0.02	+0.07	-0.01
$D\psi\delta$, $D\omega\delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Orionis. Mag. 4.6		7 Aurigæ. Mag. 3.3		ε Leporis. Mag. 3.3		β Eridani. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 59	° ' " +15 17	h m 5 0	° ' " +41 7	h m 5 1	° ' " -22 28	h m 5 3	° ' " - 5 11
Jan. 0.4	51.898	27.48	44.512	33.07	59.012	54.42	48.376	31.92
10.4	51.903	27.10	44.511	34.11	58.981	56.59	48.370	33.38
20.4	51.864	26.75	44.454	35.02	58.906	58.52	48.323	34.67
30.4	51.783	26.43	44.345	35.76	58.791	60.14	48.236	35.77
Feb. 9.3	51.667	26.13	44.190	36.30	58.643	61.42	48.115	36.67
19.3	51.523	25.86	44.000	36.60	58.467	62.34	47.968	37.34
Mar. 1.3	51.358	25.60	43.784	36.65	58.273	62.89	47.800	37.80
11.2	51.185	25.35	43.557	36.43	58.070	63.06	47.624	38.02
21.2	51.013	25.13	43.333	35.96	57.869	62.86	47.449	38.03
31.2	50.854	24.93	43.126	35.25	57.679	62.29	47.286	37.80
Apr. 10.2	50.716	24.78	42.947	34.35	57.511	61.38	47.141	37.36
20.1	50.609	24.69	42.808	33.30	57.371	60.13	47.025	36.69
30.1	50.539	24.67	42.716	32.13	57.268	58.57	46.945	35.81
May 10.1	50.512	24.75	42.677	30.92	57.206	56.75	46.904	34.72
20.1	50.530	24.95	42.696	29.70	57.188	54.68	46.904	33.45
30.0	50.594	25.26	42.772	28.54	57.216	52.42	46.949	32.02
June 9.0	50.702	25.69	42.905	27.45	57.289	50.02	47.037	30.45
19.0	50.852	26.23	43.091	26.48	57.406	47.54	47.165	28.77
28.9	51.040	26.86	43.326	25.66	57.563	45.04	47.331	27.05
July 8.9	51.262	27.58	43.602	25.01	57.766	42.60	47.530	25.33
18.9	51.513	28.35	43.915	24.53	57.981	40.28	47.757	23.66
28.9	51.785	29.14	44.257	24.24	58.232	38.17	48.007	22.08
Aug. 7.8	52.073	29.92	44.620	24.11	58.504	36.31	48.274	20.67
17.8	52.374	30.65	44.998	24.15	58.789	34.79	48.554	19.47
27.8	52.681	31.31	45.384	24.35	59.085	33.67	48.841	18.52
Sept. 6.8	52.989	31.86	45.774	24.69	59.384	32.98	49.132	17.88
16.7	53.294	32.29	46.162	25.16	59.683	32.76	49.421	17.57
26.7	53.594	32.57	46.543	25.75	59.975	33.02	49.704	17.58
Oct. 6.7	53.883	32.69	46.913	26.45	60.257	33.76	49.978	17.95
16.6	54.160	32.67	47.285	27.24	60.524	34.96	50.239	18.66
26.6	54.420	32.51	47.598	28.12	60.770	36.58	50.484	19.65
Nov. 5.6	54.660	32.24	47.903	29.08	60.991	38.54	50.709	20.91
15.6	54.874	31.88	48.177	30.12	61.185	40.79	50.908	22.36
25.5	55.060	31.46	48.413	31.21	61.345	43.22	51.078	23.97
Dec. 5.5	55.212	31.02	48.605	32.35	61.468	45.76	51.216	25.64
15.5	55.326	30.56	48.746	33.50	61.550	48.31	51.316	27.33
25.5	55.398	30.12	48.834	34.64	61.588	50.79	51.376	28.97
35.4	55.427	29.71	48.867	35.73	61.582	53.11	51.394	30.50
Mean Place	49.503	22.30	41.525	24.32	56.812	54.23	46.147	34.02
Sec δ, Tan δ	1.037	+0.273	1.328	+0.873	1.082	-0.414	1.004	-0.091
D _α α, D _α α	+0.07	0.00	+0.08	-0.02	+0.05	+0.01	+0.06	0.00
D _δ δ, D _δ δ	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aurigæ. Mag. 4.8		19 H. Camelopard. Mag. 5.2		μ Leporis. Mag. 3.3		β Orionis. (Rigel.) Mag. 0.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 7	° ' " +38 23	h m 5 8	° ' " +79 8	h m 5 9	° ' " -16 17	h m 5 10	° ' " -8 17
Jan. 0.4	47.061	22.36	60.90	30.64	14.370	69.87	35.122	46.27
10.4	47.071	23.27	60.67	38.43	14.356	71.85	35.118	47.88
20.4	47.024	24.07	60.24	35.95	14.298	73.61	35.073	49.33
30.4	47.527	24.73	59.61	38.11	14.201	75.10	34.987	50.56
Feb. 9.3	47.385	25.23	58.81	39.82	14.068	76.29	34.868	51.57
19.3	47.206	25.51	57.88	41.01	13.907	77.18	34.718	52.32
Mar. 1.3	47.003	25.58	56.87	41.65	13.728	77.74	34.549	52.83
11.2	46.785	25.40	55.82	41.71	13.538	77.97	34.370	53.07
21.2	46.570	25.01	54.77	41.19	13.348	77.87	34.191	53.07
31.2	46.368	24.41	53.79	40.13	13.168	77.47	34.022	52.81
Apr. 10.2	46.193	23.62	52.91	38.56	13.008	76.74	33.871	52.30
20.1	46.053	22.70	52.18	36.56	12.876	75.73	33.749	51.55
30.1	45.960	21.68	51.60	34.22	12.778	74.43	33.661	50.57
May 10.1	45.917	20.62	51.23	31.61	12.720	72.87	33.611	49.36
20.1	45.929	19.55	51.06	28.83	12.704	71.10	33.604	47.96
30.0	45.996	18.52	51.11	25.97	12.733	69.15	33.640	46.38
June 9.0	46.117	17.56	51.36	23.12	12.806	67.04	33.719	44.67
19.0	46.290	16.72	51.82	20.35	12.919	64.84	33.839	42.86
28.9	46.510	16.02	52.47	17.76	13.078	62.62	33.996	41.00
July 8.9	46.771	15.46	53.30	15.39	13.261	60.42	34.187	39.15
18.9	47.067	15.05	54.28	13.32	13.481	58.32	34.408	37.35
28.9	47.391	14.81	55.40	11.58	13.725	56.37	34.652	35.68
Aug. 7.8	47.788	14.71	56.63	10.20	13.991	54.65	34.916	34.18
17.8	48.099	14.78	57.94	9.23	14.270	53.21	35.193	32.91
27.8	48.470	14.92	59.31	8.67	14.568	52.19	35.479	31.92
Sept. 6.8	48.845	15.22	60.72	8.53	14.851	51.43	35.768	31.27
16.7	49.220	15.61	62.18	8.82	15.144	51.15	36.057	30.96
26.7	49.569	16.09	63.63	9.54	15.432	51.31	36.343	31.02
Oct. 6.7	49.948	16.65	64.89	10.67	15.712	51.90	36.620	31.45
16.6	50.292	17.29	66.19	12.20	15.978	52.91	36.884	32.25
26.6	50.619	18.01	67.39	14.09	16.226	54.30	37.132	33.37
Nov. 5.6	50.920	18.78	68.47	16.33	16.453	56.02	37.361	34.76
15.6	51.191	19.62	69.40	18.86	16.652	58.00	37.565	36.38
25.5	51.428	20.52	70.17	21.62	16.821	60.17	37.740	38.16
Dec. 5.5	51.623	21.46	70.74	24.55	16.956	62.44	37.882	40.02
15.5	51.771	22.43	71.10	27.56	17.062	64.73	37.986	41.90
25.5	51.865	23.40	71.24	30.57	17.105	66.97	38.049	43.73
35.4	51.906	24.33	71.15	33.46	17.115	69.05	38.070	45.45
Mean Place	44.741	14.50	51.183	19.22	12.161	70.46	32.891	47.84
Sec δ , Tan δ	1.276	+0.792	5.307	+5.212	1.042	-0.292	1.011	-0.146
$D\psi a$, $D\omega a$	+0.08	-0.01	+0.20	-0.08	+0.05	0.00	+0.06	0.00
$D\psi \delta$, $D\omega \delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Aurigæ. (<i>Capella</i>). Mag. 0.2			λ Aurigæ. Mag. 4.8			τ Orionis. Mag. 3.7			σ Columbæ. Mag. 4.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 5 10	s	° ' " +45 54	h m 5 13	s	° ' " +40 1	h m 5 18	s	° ' " - 6 55	h m 5 14	s	° ' " -34 58
Jan. 0.4	36.584	8	62.18	21.016	16	43.24	36.792	1	57.77	31.580	49	34.00
10.4	36.542	8	63.48	21.032	16	44.22	36.793	1	59.34	31.531	49	37.36
20.4	36.486	56	64.65	20.982	40	45.11	36.751	43	60.75	31.434	97	39.75
30.4	36.373	113	65.64	20.898	94	45.84	36.669	83	61.94	31.294	140	41.76
Feb. 9.3	36.208	166	66.38	20.757	141	46.41	36.551	118	62.92	31.114	180	43.37
19.3	36.003	206	66.87	20.578	179	46.77	36.406	146	63.66	30.903	211	44.54
Mar. 1.3	35.770	233	67.05	20.371	207	46.88	36.239	167	64.17	30.671	232	45.26
11.3	35.522	246	66.93	20.151	220	46.74	36.061	178	64.42	30.428	243	45.52
21.2	35.274	246	66.51	19.930	231	46.37	35.883	178	64.44	30.185	243	45.33
31.2	35.042	232	65.79	19.722	208	45.77	35.715	168	64.21	29.952	223	44.68
Apr. 10.2	34.839	163	64.84	19.539	146	44.97	35.565	123	63.75	29.740	183	43.62
20.1	34.676	113	63.67	19.394	101	44.01	35.442	91	63.05	29.557	145	42.14
30.1	34.563	57	62.35	19.293	50	42.93	35.351	50	62.13	29.412	103	40.31
May 10.1	34.506	5	60.94	19.243	6	41.79	35.301	9	60.39	29.310	55	38.16
20.1	34.511	66	59.48	19.249	62	40.63	35.292	84	59.67	29.255	6	35.73
30.0	34.577	126	58.06	19.311	39.49	38.41	35.326	78	58.19	29.249	44	33.07
June 9.0	34.703	184	56.64	19.428	117	38.41	35.404	119	56.55	29.293	92	30.27
19.0	34.887	238	55.36	19.598	170	37.44	35.523	155	54.82	29.385	130	27.38
29.0	35.125	288	54.22	19.817	219	36.59	35.678	190	53.04	29.524	181	24.47
July 8.9	35.408	324	53.24	20.079	268	35.89	35.868	221	51.24	29.705	219	21.64
18.9	35.732	387	52.45	20.377	328	34.95	36.069	243	49.51	29.924	252	18.97
28.9	36.089	442	51.85	20.705	382	34.73	36.381	263	47.90	30.176	277	16.52
Aug. 7.8	36.471	492	51.44	21.057	368	34.66	36.594	276	46.44	30.453	300	14.40
17.8	36.873	412	51.24	21.425	379	34.72	36.870	285	45.21	30.753	313	12.67
27.8	37.285	419	51.22	21.804	384	34.92	37.155	288	44.24	31.066	321	11.40
Sept. 6.8	37.704	418	51.39	22.188	385	35.23	37.443	290	43.59	31.387	322	10.63
16.7	38.122	413	51.72	22.573	380	35.65	37.783	285	43.28	31.710	320	10.41
26.7	38.535	402	52.23	22.953	370	36.17	38.018	278	43.31	32.030	309	10.75
Oct. 6.7	38.937	387	52.90	23.323	366	36.78	38.296	267	43.72	32.339	298	11.66
16.6	39.324	366	53.70	23.679	359	37.49	38.563	260	44.47	32.632	271	13.10
26.6	39.690	338	54.04	24.018	314	38.28	38.813	231	45.55	32.903	242	15.03
Nov. 5.6	40.028	304	55.71	24.332	284	39.14	39.044	205	46.89	33.145	210	17.37
15.6	40.332	264	56.91	24.616	248	40.08	39.249	179	48.44	33.355	171	20.06
25.5	40.596	217	58.19	24.864	205	41.08	39.428	148	50.16	33.526	139	22.98
Dec. 5.5	40.813	163	59.55	25.069	159	42.11	39.574	107	51.96	33.655	82	26.06
15.5	40.976	104	60.94	25.228	104	43.14	39.681	67	53.78	33.737	31	29.14
25.5	41.060	42	62.34	25.332	47	44.15	39.748	26	55.54	33.768	19	32.15
35.4	41.122		63.71	25.379			39.774		57.20	33.749		34.99
Mean Place	33.306		53.67	18.021		35.62	34.551		59.47	29.293		33.36
Sec δ , Tan δ	1.437		+1.083	1.306		+0.840	1.007		-0.122	1.220		-0.700
$D\psi\alpha$, $D_\omega\alpha$	+0.09		-0.01	+0.08		-0.01	+0.06		0.00	+0.04		+0.01
$D\psi\delta$, $D_\omega\delta$	+0.1		+1.0	+0.1		+1.0	+0.1		+1.0	+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Orionis. (Bellatrix.) Mag. 1.7			β Tauri. Mag. 1.8			17 Camelop. Mag. 5.8			β Leporis. Mag. 3.0		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 5 20	° ' " + 6 16		h m 5 21	° ' " +28 32		h m 5 22	° ' " +62 59		h m 5 24	° ' " -20 49	
Jan. 0.4	43.058	34.70		5.326	24.26		24.28	67.20		43.577	29.08	
10.4	43.076	33.79 91		5.353	24.61 35		24.27 1	69.38 218		43.569 8	31.34 226	
20.4	43.050	32.98 81		5.328	24.94 33		24.17 10	71.39 201		43.516 53	33.34 200	
30.4	42.982	32.29 69		5.256	25.23 29		23.98 19	73.13 174		43.421 95	35.06 172	
Feb. 9.3	42.876	31.70 59		5.141	25.43 20		23.71 27	74.55 142		43.287 134	36.48 142	
19.3	42.740	31.23 47		4.991	25.54 11		23.38 33	75.56 101		43.124 163	37.53 105	
Mar. 1.3	42.581	30.87 36		4.815	25.53 1		23.00 38	76.14 58		42.938 186	38.24 71	
11.3	42.411	30.64 23		4.625	25.40 13		22.58 42	76.26 12		42.740 198	38.58 34	
21.2	42.238	30.51 13		4.433	25.14 26		22.18 40	75.92 34		42.538 202	38.57 1	
31.2	42.075	30.49 2		4.250	24.78 36		21.80 38	75.14 78		42.345 193	38.19 38	
Apr. 10.2	41.929	30.60 11		4.089	24.32 46		21.46 34	73.96 118		42.170 175	37.46 73	
20.1	41.810	30.85 25		3.959	23.79 53		21.17 29	72.42 154		42.020 150	36.41 106	
30.1	41.724	31.22 86		3.866	23.23 56		20.95 22	70.59 183		41.904 116	35.06 135	
May 10.1	41.677	31.72 47		3.819	22.66 57		20.81 14	68.54 205		41.826 78	33.42 164	
20.1	41.673	32.37 4		3.820	22.12 54		20.75 6	66.36 218		41.790 36	31.54 188	
30.0	41.712	33.14 39		3.870	21.63 49		20.80 5	64.11 225		41.799 9	29.45 209	
June 9.0	41.794	34.03 82		3.968	21.21 42		20.93 13	61.86 225		41.852 53	27.21 224	
19.0	41.917	35.02 123		4.113	20.89 32		21.15 22	59.68 218		41.947 95	24.86 235	
29.0	42.078	36.08 161		4.299	20.68 21		21.45 30	57.64 204		42.083 136	22.48 238	
July 8.9	42.272	37.19 194		4.524	20.57 11		21.82 37	55.76 188		42.257 174	20.12 286	
18.9	42.495	38.30 223		4.782	20.56 1		22.26 44	54.12 164		42.463 206	17.85 227	
28.9	42.742	39.38 108		5.065	20.63 7		22.76 50	52.73 139		42.697 234	15.77 206	
Aug. 7.8	43.009	40.38 267		5.371	20.78 15		23.30 54	51.63 110		42.954 257	13.91 186	
17.8	43.289	41.27 89		5.691	20.99 21		23.87 57	50.82 81		43.229 275	12.37 154	
27.8	43.578	41.98 71		6.021	21.24 25		24.47 60	50.32 50		43.515 286	11.19 118	
Sept. 6.8	43.872	42.51 53		6.357	21.51 27		25.09 62	50.14 18		43.810 295	10.42 77	
16.7	44.168	42.82 31		6.694	21.78 27		25.71 62	50.28 14		44.106 296	10.11 31	
26.7	44.460	42.90 8		7.028	22.04 26		26.32 61	50.72 44		44.402 296	10.27 16	
Oct. 6.7	44.746	42.73 17		7.356	22.29 25		26.92 60	51.49 77		44.690 288	10.90 63	
16.7	45.023	42.34 39		7.673	22.51 22		27.51 59	52.55 106		44.967 277	11.99 109	
26.6	45.285	41.74 60		7.974	22.73 22		28.06 55	53.89 134		45.228 259	13.50 151	
Nov. 5.6	45.530	40.95 79		8.257	22.95 22		28.56 50	55.49 160		45.466 240	15.37 187	
15.6	45.752	40.03 92		8.515	23.19 24		29.01 45	57.32 183		45.680 214	17.56 219	
25.5	45.948	39.01 102		8.742	23.45 26		29.40 39	59.37 205		45.864 184	19.94 238	
Dec. 5.5	46.111	37.94 163		8.934	23.73 28		29.72 32	61.56 219		46.010 146	22.45 251	
15.5	46.237	36.87 126		9.084	24.04 31		29.96 24	63.84 228		46.117 107	25.01 256	
25.5	46.323	35.83 86		9.188	24.37 38		30.10 14	66.15 231		46.181 64	27.51 260	
35.4	46.366	34.85 43		9.242	24.71 34		30.14 4	68.40 225		46.199 18	29.87 236	
Mean Place	40.711	31.57		2.635	18.52		19.643	58.21		41.340	29.19	
Sec δ , Tan δ	1.006	+0.110		1.138	+0.544		2.203	+1.963		1.070	-0.380	
D ψ α , D ω α	+0.06	0.00		+0.08	-0.01		+0.11	-0.02		+0.05	0.00	
D ψ δ , D ω δ	+0.1	+1.0		+0.1	+1.0		+0.1	+1.0		+0.1	+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Aurigæ. Mag. 4.9		δ Orionis. Mag. 2.5		Groombridge 966. Mag. 6.4		α Leporis. Mag. 2.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 27	° ' " +32 7	h m 5 27	° ' " - 0 21	h m 5 28	° ' " +74 59	h m 5 29	° ' " -17 52
	s	"	s	"	s	"	s	"
Jan. 0.5	22.271	60.02	48.242	32.53	44.61	37.51	6.401	50.86
10.4	22.302	60.59	48.262	33.82	44.56	40.22	6.402	53.00
20.4	22.282	61.12	48.237	34.96	44.33	42.72	6.357	54.92
30.4	22.209	61.59	48.170	35.95	43.94	44.91	6.270	56.57
Feb. 9.3	22.094	61.95	48.065	36.78	43.43	46.71	6.145	57.94
19.3	21.940	62.20	47.930	37.41	42.81	48.06	5.988	58.97
Mar. 1.3	21.759	62.29	47.771	37.88	42.11	48.89	5.809	59.67
11.3	21.562	62.22	47.599	38.15	41.37	49.18	5.617	60.04
21.2	21.362	62.00	47.424	38.25	40.62	48.92	5.421	60.07
31.2	21.170	61.60	47.257	38.17	39.90	48.12	5.233	59.75
Apr. 10.2	21.000	61.11	47.106	37.90	39.24	46.83	5.062	59.11
20.2	20.858	60.51	46.981	37.47	38.67	45.10	4.915	58.17
30.1	20.758	59.82	46.887	36.84	38.22	43.00	4.802	56.93
May 10.1	20.702	59.09	46.831	36.05	37.91	40.62	4.726	55.43
20.1	20.696	58.37	46.817	35.09	37.74	38.02	4.691	53.68
30.0	20.740	57.68	46.845	33.97	37.72	35.32	4.700	51.73
June 9.0	20.833	57.06	46.915	32.73	37.87	32.58	4.752	49.62
19.0	20.976	56.51	47.026	31.40	38.16	29.88	4.845	47.42
29.0	21.161	56.05	47.175	30.00	38.60	27.31	4.979	45.16
July 8.9	21.386	55.71	47.357	28.57	39.17	24.92	5.150	42.92
18.9	21.647	55.47	47.569	27.16	39.86	22.77	5.353	40.77
28.9	21.934	55.35	47.806	25.82	40.65	20.90	5.583	38.77
Aug. 7.9	22.245	55.31	48.063	24.62	41.52	19.36	5.837	36.98
17.8	22.573	55.35	48.335	23.57	42.46	18.18	6.107	35.49
27.8	22.913	55.48	48.617	22.72	43.46	17.38	6.389	34.34
Sept. 6.8	23.261	55.64	48.905	22.14	44.50	16.96	6.680	33.59
16.7	23.610	55.84	49.196	21.85	45.54	16.93	6.974	33.26
26.7	23.957	56.08	49.485	21.84	46.58	17.32	7.267	33.38
Oct. 6.7	24.299	56.33	49.769	22.14	47.62	18.10	7.554	33.96
16.7	24.631	56.62	50.044	22.74	48.60	19.27	7.831	34.97
26.6	24.950	56.91	50.305	23.59	49.54	20.81	8.092	36.38
Nov. 5.6	25.246	57.26	50.550	24.69	50.40	22.68	8.335	38.15
15.6	25.518	57.62	50.772	25.96	51.16	24.88	8.552	40.21
25.6	25.760	58.06	50.968	27.36	51.81	27.33	8.741	42.47
Dec. 5.5	25.983	58.53	51.132	28.83	52.32	29.99	8.894	44.85
15.5	26.125	59.05	51.260	30.33	52.68	32.77	9.008	47.27
25.5	26.240	59.59	51.347	31.78	52.88	35.59	9.079	49.66
35.4	26.302	60.14	51.392	33.15	52.91	38.37	9.106	51.92
Mean Place	19.471	54.32	45.937	34.69	37.064	28.43	4.156	51.25
Sec δ , Tan δ	1.181	+0.628	1.000	-0.006	3.862	+3.730	1.051	-0.323
$D_{\psi} \alpha$, $D_{\mu} \alpha$	+0.08	-0.01	+0.06	0.00	+0.16	-0.03	+0.05	0.00
$D_{\psi} \delta$, $D_{\mu} \delta$	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0	+0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ Orionis. Mag. 4.5		ι Orionis. Mag. 2.9		ϵ Orionis. Mag. 1.8		ζ Tauri. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 30	° ' " + 9 26	h m 5 31	° ' " - 5 57	h m 5 32	° ' " - 1 15	h m 5 32	° ' " +21 5
	s	"	s	"	s	"	s	"
Jan. 0.5	18.175	6.44	24.638	47.17	2.382	12.25	43.590	38.61
10.4	18.204	5.69	24.655	48.75	2.404	13.60	43.626	38.52
20.4	18.187	5.03	24.628	50.18	2.382	14.80	43.614	38.47
30.4	18.126	4.45	24.559	51.41	2.317	15.84	43.555	38.44
Feb. 9.3	18.028	3.98	24.452	52.43	2.214	16.70	43.454	38.40
19.3	17.896	3.60	24.314	53.21	2.080	17.37	43.319	38.34
Mar. 1.3	17.741	3.28	24.151	53.77	1.922	17.86	43.156	38.26
11.3	17.571	3.07	23.976	54.09	1.750	18.15	42.979	38.13
21.2	17.397	2.93	23.797	54.18	1.574	18.25	42.797	37.97
31.2	17.232	2.88	23.624	54.02	1.406	18.17	42.622	37.76
Apr. 10.2	17.081	2.91	23.469	53.65	1.252	17.89	42.466	37.52
20.2	16.958	3.04	23.338	53.04	1.124	17.43	42.337	37.28
30.1	16.865	3.28	23.237	52.22	1.027	16.78	42.241	37.06
May 10.1	16.813	3.63	23.174	51.20	0.968	15.96	42.187	36.86
20.1	16.801	4.09	23.152	49.98	0.950	14.97	42.177	36.72
30.0	16.833	4.66	23.172	48.60	0.973	13.82	42.213	36.64
June 9.0	16.909	5.35	23.234	47.08	1.039	12.55	42.295	36.64
19.0	17.026	6.13	23.337	45.45	1.146	11.18	42.420	36.73
29.0	17.181	6.98	23.477	43.76	1.289	9.74	42.585	36.90
July 8.9	17.371	7.88	23.653	42.07	1.467	8.29	42.787	37.15
18.9	17.591	8.80	23.859	40.42	1.676	6.85	43.020	37.46
28.9	17.834	9.70	24.090	38.86	1.909	5.48	43.280	37.81
Aug. 7.9	18.099	10.55	24.342	37.45	2.163	4.25	43.560	38.18
17.8	18.378	11.29	24.610	36.26	2.432	3.18	43.856	38.54
27.8	18.668	11.92	24.889	35.31	2.712	2.33	44.164	38.88
Sept. 6.8	18.964	12.37	25.175	34.68	2.999	1.75	44.479	39.16
16.7	19.262	12.63	25.464	34.37	3.290	1.46	44.796	39.35
26.7	19.559	12.71	25.752	34.40	3.579	1.46	45.112	39.47
Oct. 6.7	19.851	12.57	26.035	34.79	3.863	1.78	45.424	39.51
16.7	20.134	12.22	26.310	35.53	4.140	2.41	45.726	39.46
26.6	20.406	11.70	26.571	36.59	4.403	3.30	46.018	39.33
Nov. 5.6	20.660	11.01	26.816	37.91	4.650	4.45	46.293	39.13
15.6	20.893	10.21	27.038	39.45	4.876	5.77	46.545	38.91
25.6	21.100	9.33	27.234	41.16	5.074	7.23	46.769	38.68
Dec. 5.5	21.275	8.41	27.397	42.95	5.242	8.77	46.962	38.46
15.5	21.414	7.50	27.523	44.77	5.373	10.32	47.115	38.26
25.5	21.512	6.62	27.609	46.55	5.463	11.84	47.225	38.09
35.4	21.566	5.81	27.651	48.22	5.511	13.27	47.289	37.98
Mean Place	15.778	3.84	22.359	48.67	0.075	14.21	41.020	34.40
Sec δ , Tan δ	1.014	+0.166	1.005	-0.104	1.000	-0.022	1.072	+0.386
$D\psi\alpha$, $D_m\alpha$	+0.07	0.00	+0.06	0.00	+0.06	0.00	+0.07	0.00
$D\psi\delta$, $D_m\delta$	+0.1	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

APPARENT PLACES OF STARS, 1917.

365

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Orionis. Mag. 2.0		α Columbae. Mag. 2.8		ο Aurigae. Mag. 5.5		ζ Leporis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s	° ' " — 1 58	h m s	° ' " — 34 6	h m s	° ' " + 49 47	h m s	° ' " — 14 50
Jan. 0.5	36.535	66.70	40.923	64.80	31.665	34.69	13.910	66.78
10.4	36.561	68.11 141	40.900 28	67.59 270	31.697 42	36.25 166	13.928 18	68.79 206
20.4	36.541	69.37 126	40.826 74	70.11 263	31.670 27	37.73 148	13.900 28	70.67 188
30.4	36.480	70.45 108	40.706 121	72.29 218	31.575 95	39.06 123	13.828 72	72.29 162
Feb. 9.3	36.379 101	71.35 90	40.541 164	74.09 180	31.420 165	40.14 109	13.716 112	73.65 136
19.3	36.247 182	72.05 70	40.344 197	75.48 130	31.214 206	40.97 63	13.572 144	74.71 106
Mar. 1.3	36.090 167	72.56 61	40.121 228	76.42 94	30.972 242	41.51 54	13.402 170	75.46 74
11.3	35.919 171	72.86 30	39.883 238	76.90 48	30.705 267	41.70 19	13.217 185	75.89 44
21.2	35.743 176	72.97 11	39.640 243	76.93 8	30.431 274	41.55 15	13.026 191	76.01 12
31.2	35.573 170	72.89 8	39.404 236	76.51 42	30.167 264	41.08 47	12.840 186	75.81 20
Apr. 10.2	35.418 155	72.60 29	39.186 218	75.67 84	29.925 262	40.30 78	12.669 171	75.32 49
20.2	35.287 121	72.13 47	38.993 196	74.41 126	29.721 204	39.25 105	12.520 149	74.53 79
30.1	35.186 101	71.46 67	38.834 159	72.78 163	29.565 146	37.96 129	12.403 117	73.46 107
May 10.1	35.123 63	70.62 84	38.716 118	70.80 198	29.465 100	36.51 145	12.321 82	72.14 132
20.1	35.100 23	69.61 101	38.642 74	68.54 236	29.427 88	34.95 155	12.279 42	70.58 156
30.0	35.119 19	68.44 117	38.615 27	66.03 251	29.452 25	33.33 162	12.279 0	68.83 175
June 9.0	35.180 61	67.15 139	38.636 21	63.33 270	29.542 90	31.71 162	12.321 42	66.92 191
19.0	35.281 101	65.75 140	38.705 69	60.52 261	29.695 153	30.13 168	12.405 84	64.90 202
29.0	35.420 129	64.29 146	38.820 115	57.68 284	29.905 210	28.64 149	12.529 124	62.81 209
July 8.9	35.594 174	62.81 148	38.978 158	54.87 261	30.169 264	27.26 138	12.688 159	60.73 206
18.9	35.796 204	61.36 145	39.175 197	52.17 270	30.480 311	26.06 120	12.879 191	58.71 202
28.9	36.027 229	59.98 136	39.405 230	49.69 248	30.831 351	25.03 103	13.099 220	56.82 189
Aug. 7.9	36.279 252	58.72 126	39.666 261	47.49 220	31.213 382	24.18 85	13.342 243	55.13 169
17.8	36.546 267	57.65 107	39.949 283	45.66 183	31.622 409	23.54 64	13.604 262	53.68 145
27.8	36.824 278	56.79 86	40.252 308	44.24 143	32.050 428	23.09 45	13.880 276	52.56 112
Sept. 6.8	37.110 285	56.20 59	40.566 314	43.34 80	32.491 441	22.86 23	14.165 285	51.81 75
16.7	37.400 290	55.91 29	40.886 320	42.96 28	32.939 448	22.82 4	14.455 290	51.45 36
26.7	37.689 299	55.93 2	41.208 323	43.13 17	33.387 448	22.99 17	14.747 292	51.52 7
Oct. 6.7	37.974 265	56.27 24	41.523 315	43.87 74	33.829 443	23.35 36	15.036 289	52.03 51
16.7	38.262 278	56.92 66	41.825 302	45.16 139	34.261 433	23.91 66	15.317 281	52.94 91
26.6	38.548 266	57.84 92	42.112 287	46.96 179	34.677 416	24.67 76	15.586 269	54.25 181
Nov. 5.6	38.766 248	59.02 118	42.373 261	48.96 224	35.067 390	25.61 94	15.837 251	55.91 166
15.6	38.996 239	60.39 137	42.606 233	51.80 261	35.425 358	26.73 112	16.067 230	57.84 193
25.6	39.197 208	61.80 151	42.802 196	54.67 287	35.743 318	28.00 127	16.268 201	59.99 215
Dec. 5.5	39.368 171	63.50 160	42.956 154	57.72 305	36.012 269	29.41 141	16.437 169	62.26 227
15.5	39.502 134	65.11 161	43.065 109	60.83 311	36.225 213	30.93 162	16.568 131	64.58 232
25.5	39.597 95	66.67 156	43.124 59	63.90 307	36.375 150	32.51 158	16.656 88	66.86 228
35.4	39.648 61	68.17 160	43.131 7	66.83 263	36.456 81	34.09 156	16.700 44	69.04 218
Mean Place	34.227	68.47	38.609	64.00	28.107	28.40	11.644	67.32
Sec δ, Tan δ	1.001	-0.035	1.208	-0.677	1.549	+1.183	1.035	-0.265
Dψ α, Dω α	+0.06	0.00	+0.04	0.00	+0.09	-0.01	+0.05	0.00
Dψ δ, Dω δ	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Orionis. Mag. 2.2		δ Doradus. Mag. 4.5		ν Aurigæ. Mag. 4.2		δ Leporis. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 43	° ' " - 9 41	h m 5 44	° ' " -65 45	h m 5 45	° ' " +39 7	h m 5 47	° ' " -20 52
	s	"	s	"	s	"	s	"
Jan. 0.5	51.466	52.68	40.61	61.68	47.262	36.60	47.352	66.94
10.4	51.491	54.52	40.42	65.04	47.315	37.56	47.367	69.33
20.4	51.470	56.16	40.14	68.09	47.308	38.50	47.333	71.48
30.4	51.405	57.59	39.77	70.75	47.246	39.36	47.255	73.38
Feb. 9.4	51.301	58.77	39.33	72.95	47.131	40.08	47.136	74.96
19.3	51.165	59.71	38.84	74.64	46.972	40.64	46.983	76.19
Mar. 1.3	51.002	60.37	38.30	75.81	46.780	41.01	46.805	77.09
11.3	50.825	60.77	37.73	76.43	46.565	41.14	46.610	77.62
21.2	50.641	60.89	37.16	76.49	46.343	41.05	46.409	77.78
31.2	50.462	60.74	36.60	76.01	46.128	40.72	46.211	77.57
Apr. 10.2	50.299	60.35	36.06	75.02	45.930	40.19	46.028	77.02
20.2	50.157	59.69	35.56	73.53	45.762	39.47	45.867	76.15
30.1	50.046	58.79	35.12	71.59	45.634	38.61	45.736	74.95
May 10.1	49.970	57.65	34.75	69.26	45.552	37.63	45.640	73.46
20.1	49.934	56.32	34.45	66.56	45.521	36.58	45.586	71.71
30.1	49.940	54.81	34.24	63.59	45.545	35.51	45.574	69.75
June 9.0	49.986	53.13	34.12	60.42	45.621	34.46	45.605	67.61
19.0	50.075	51.36	34.09	57.10	45.751	33.45	45.680	65.36
29.0	50.202	49.53	34.15	53.75	45.929	32.52	45.795	63.04
July 8.9	50.364	47.68	34.30	50.45	46.152	31.68	45.947	60.73
18.9	50.557	45.88	34.54	47.29	46.414	30.97	46.133	58.49
28.9	50.778	44.20	34.85	44.38	46.710	30.37	46.351	56.40
Aug. 7.9	51.020	42.68	35.25	41.81	47.031	29.89	46.592	54.53
17.8	51.282	41.39	35.70	39.65	47.376	29.53	46.855	52.96
27.8	51.556	40.37	36.20	38.00	47.736	29.29	47.132	51.72
Sept. 6.8	51.839	39.68	36.74	36.92	48.107	29.15	47.421	50.90
16.8	52.128	39.35	37.30	36.47	48.483	29.12	47.717	50.52
26.7	52.417	39.41	37.86	36.66	48.863	29.19	48.014	50.61
Oct. 6.7	52.704	39.84	38.42	37.50	49.239	29.35	48.309	51.18
16.7	52.984	40.66	38.95	39.00	49.607	29.62	48.596	52.22
26.6	53.252	41.83	39.44	41.08	49.961	29.99	48.872	53.69
Nov. 5.6	53.503	43.30	39.86	43.69	50.298	30.45	49.128	55.54
15.6	53.734	45.03	40.22	46.74	50.609	31.02	49.363	57.72
25.6	53.938	46.94	40.50	50.12	50.890	31.70	49.568	60.13
Dec. 5.5	54.111	48.96	40.68	53.73	51.130	32.47	49.738	62.71
15.5	54.246	51.01	40.77	57.43	51.324	33.34	49.869	65.34
25.5	54.341	53.03	40.75	61.10	51.466	34.27	49.957	67.94
35.5	54.392	54.96	40.62	64.61	51.552	35.23	49.999	70.43
Mean Place	49.186	53.66	37.312	60.00	44.198	31.68	45.084	67.11
Sec δ , Tan δ	1.014	-0.171	2.437	-2.222	1.289	+0.813	1.070	-0.382
$D_{\psi} \alpha$, $D_{\alpha} \alpha$	+0.06	0.00	0.00	+0.01	+0.08	0.00	+0.05	0.00
$D_{\psi} \delta$, $D_{\alpha} \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Orionis. (Betelgeux.) Var. 1.0-1.4		η Leporis. Mag. 3.8		δ Aurigæ. Mag. 3.9		β Aurigæ. Mag. 2.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 50	° ' " + 7 23	h m 5 52	° ' " -14 10	h m 5 52	° ' " +54 16	h m 5 53	° ' " +44 56
	s	"	s	"	s	"	s	"
Jan. 0.5	43.093	35.43	39.737	54.69	45.533	53.00	29.793	29.88
10.4	43.140	34.51	39.764	56.76	45.594	54.81	29.856	31.19
20.4	43.139	33.69	39.746	58.65	45.577	56.54	29.853	32.45
30.4	43.093	33.01	39.682	60.29	45.483	58.11	29.787	33.60
Feb. 9.4	43.006	32.44	39.578	61.68	45.320	59.47	29.663	34.61
19.3	42.883	31.98	39.440	62.77	45.100	60.54	29.490	35.40
Mar. 1.3	42.734	31.64	39.275	63.55	44.834	61.28	29.279	35.95
11.3	42.567	31.42	39.094	64.03	44.540	61.66	29.043	36.22
21.3	42.393	31.29	38.904	64.19	44.234	61.66	28.796	36.21
31.2	42.223	31.27	38.717	64.04	43.933	61.28	28.554	35.90
Apr. 10.2	42.067	31.35	38.545	63.61	43.654	60.54	28.331	35.33
20.2	41.932	31.54	38.393	62.87	43.413	59.48	28.138	34.50
30.1	41.829	31.84	38.270	61.88	43.221	58.15	27.987	33.48
May 10.1	41.761	32.25	38.182	60.62	43.088	56.60	27.886	32.28
20.1	41.733	32.78	38.133	59.13	43.020	54.88	27.840	30.99
30.1	41.747	33.43	38.126	57.45	43.023	53.06	27.851	29.63
June 9.0	41.803	34.18	38.160	55.60	43.094	51.20	27.921	28.25
19.0	41.898	35.01	38.236	53.64	43.235	49.36	28.047	26.90
29.0	42.033	35.92	38.352	51.61	43.440	47.58	28.227	25.62
July 8.9	42.203	36.86	38.503	49.58	43.705	45.91	28.457	24.44
18.9	42.404	37.80	38.686	47.61	44.023	44.38	28.730	23.36
28.9	42.631	38.72	38.900	45.74	44.388	43.02	29.040	22.42
Aug. 7.9	42.881	39.57	39.136	44.06	44.792	41.87	29.382	21.63
17.8	43.147	40.29	39.393	42.63	45.228	40.92	29.749	21.00
27.8	43.426	40.89	39.664	41.51	45.687	40.21	30.135	20.51
Sept. 6.8	43.715	41.30	39.946	40.75	46.164	39.71	30.536	20.18
16.8	44.009	41.49	40.235	40.37	46.652	39.46	30.945	20.01
26.7	44.305	41.47	40.527	40.42	47.145	39.45	31.357	19.99
Oct. 6.7	44.600	41.22	40.816	40.88	47.634	39.68	31.767	20.12
16.7	44.889	40.75	41.101	41.76	48.117	40.15	32.171	20.41
26.6	45.169	40.07	41.373	43.04	48.582	40.86	32.561	20.86
Nov. 5.6	45.435	39.22	41.630	44.67	49.021	41.80	32.933	21.46
15.6	45.682	38.25	41.867	46.57	49.427	42.97	33.278	22.24
25.6	45.904	37.18	42.077	48.70	49.790	44.34	33.589	23.15
Dec. 5.5	46.097	36.07	42.255	50.95	50.101	45.90	33.857	24.21
15.5	46.254	34.96	42.396	53.26	50.350	47.60	34.075	25.39
25.5	46.370	33.89	42.495	55.53	50.529	49.38	34.237	26.64
35.5	46.441	32.89	42.549	57.71	50.633	51.20	34.335	27.94
Mean Place	40.683	33.32	37.461	55.27	41.636	47.67	26.464	25.22
Sec δ , Tan δ	1.008	+0.130	1.031	-0.253	1.713	+1.391	1.413	+0.998
$D\psi\alpha$, $D_m\alpha$	+0.06	0.00	+0.05	0.00	+0.10	0.00	+0.09	0.00
$D\psi\delta$, $D_m\delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aurigæ. Mag. 2.7		1 Geminorum. Mag. 4.3		1 G. Puppis. Mag. 6.2		γ Orionis. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 54	° ' " +37 12	h m 5 59	° ' " +23 16	h m 6 2	° ' " -45 1	h m 6 2	° ' " +14 46
Jan. 0.5	6.702	32.65	7.161	10.62	7.553	70.36	52.529	47.84
10.4	6.766	33.51	7.226	10.62	7.529	73.61	52.592	47.33
20.4	6.770	34.35	7.238	10.68	7.445	76.58	52.605	46.90
30.4	6.717	35.14	7.201	10.77	7.303	79.22	52.571	46.56
Feb. 9.4	6.613	35.82	7.118	10.87	7.111	81.45	52.493	46.30
19.3	6.464	36.37	6.994	10.96	6.877	83.25	52.376	46.10
Mar. 1.3	6.281	36.75	6.839	11.02	6.609	84.57	52.230	45.95
11.3	6.074	36.91	6.664	11.03	6.320	85.38	52.063	45.84
21.3	5.859	36.88	6.480	10.97	6.022	85.69	51.888	45.75
31.2	5.648	36.62	6.298	10.85	5.725	85.50	51.714	45.69
Apr. 10.2	5.453	36.18	6.130	10.67	5.442	84.83	51.552	45.66
20.2	5.286	35.57	5.984	10.44	5.183	83.68	51.411	45.66
30.1	5.156	34.80	5.871	10.18	4.958	82.10	51.300	45.70
May 10.1	5.070	33.93	5.795	9.92	4.773	80.12	51.225	45.80
20.1	5.034	33.00	5.762	9.68	4.635	77.81	51.190	45.96
30.1	5.049	32.04	5.773	9.47	4.548	75.18	51.197	46.21
June 9.0	5.116	31.08	5.830	9.29	4.514	72.33	51.245	46.51
19.0	5.234	30.16	5.931	9.17	4.534	69.31	51.336	46.89
29.0	5.400	29.31	6.072	9.11	4.608	66.23	51.467	47.32
July 9.0	5.609	28.53	6.253	9.11	4.732	63.16	51.633	47.80
18.9	5.858	27.86	6.467	9.16	4.905	60.19	51.832	48.30
28.9	6.138	27.29	6.709	9.24	5.123	57.39	52.058	48.80
Aug. 7.9	6.447	26.81	6.976	9.35	5.380	54.88	52.308	49.27
17.8	6.777	26.44	7.264	9.45	5.672	52.73	52.576	49.68
27.8	7.125	26.16	7.566	9.54	5.990	51.03	52.880	50.00
Sept. 6.8	7.484	25.97	7.878	9.58	6.330	49.85	53.154	50.20
16.8	7.851	25.86	8.197	9.58	6.685	49.23	53.455	50.27
26.7	8.220	25.83	8.519	9.51	7.046	49.22	53.761	50.19
Oct. 6.7	8.589	25.88	8.841	9.38	7.406	49.82	54.067	49.94
16.7	8.952	26.00	9.160	9.18	7.758	51.03	54.369	49.56
26.7	9.303	26.22	9.468	8.93	8.094	52.82	54.664	49.05
Nov. 5.6	9.639	26.53	9.764	8.66	8.402	55.12	54.947	48.44
15.6	9.951	26.94	10.042	8.37	8.678	57.88	55.211	47.74
25.6	10.234	27.45	10.293	8.10	8.913	60.98	55.453	47.00
Dec. 5.5	10.479	28.06	10.513	7.88	9.100	64.31	55.685	46.26
15.5	10.680	28.78	10.696	7.71	9.232	67.76	55.841	45.57
25.5	10.830	29.56	10.835	7.60	9.306	71.22	55.975	44.91
35.5	10.925	30.40	10.926	7.56	9.320	74.56	56.064	44.34
Mean Place	3.685	28.56	4.505	7.83	5.082	69.80	50.011	45.79
Sec δ , Tan δ	1.256	+0.759	1.089	+0.430	1.415	-1.002	1.034	+0.264
$D\psi\alpha$, $D_w\alpha$	+0.08	0.00	+0.07	0.00	+0.03	0.00	+0.07	0.00
$D\psi\delta$, $D_w\delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 H. Camelop. Mag. 4.7		7 Geminorum. Var. 3.2-4.2		2 Lynceis. Mag. 4.4		♄ Canis Majoris. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 9	° ' " +69 20	h m 6 9	° ' " +22 31	h m 6 12	° ' " +59 2	h m 6 17	° ' " -30 1
Jan. 0.5	48.24	67.75	54.755	56.99	22.586	37.09	9.844	33.95
10.5	48.33	70.28	54.829	56.93	22.679	39.14	9.874	36.82
20.4	48.30	72.73	54.851	56.95	22.682	41.15	9.851	39.48
30.4	48.13	75.01	54.823	57.02	22.597	43.03	9.778	41.87
Feb. 9.4	47.85	77.00	54.747	57.11	22.432	44.69	9.658	43.91
19.3	47.47	78.64	54.630	57.21	22.196	46.09	9.498	45.57
Mar. 1.3	47.02	79.86	54.482	57.28	21.904	47.13	9.308	46.83
11.3	46.51	80.61	54.310	57.31	21.574	47.78	9.094	47.69
21.3	45.97	80.87	54.128	57.30	21.222	48.02	8.870	48.11
31.2	45.44	80.62	53.945	57.23	20.872	47.84	8.645	48.11
Apr. 10.2	44.93	79.88	53.775	57.10	20.539	47.25	8.430	47.69
20.2	44.47	78.69	53.625	56.94	20.241	46.29	8.233	46.87
30.2	44.09	77.09	53.506	56.74	19.992	44.98	8.064	45.67
May 10.1	43.80	75.16	53.424	56.53	19.805	43.39	7.927	44.12
20.1	43.60	72.95	53.382	56.33	19.688	41.58	7.830	42.27
30.1	43.50	70.56	53.383	56.15	19.647	39.61	7.776	40.13
June 9.0	43.52	68.05	53.429	56.01	19.684	37.54	7.765	37.78
19.0	43.66	65.47	53.519	55.91	19.796	35.44	7.798	35.27
29.0	43.90	62.93	53.650	55.87	19.984	33.35	7.874	32.65
July 9.0	44.24	60.48	53.819	55.87	20.240	31.34	7.992	30.02
18.9	44.67	58.17	54.022	55.91	20.559	29.45	8.148	27.46
28.9	45.19	56.06	54.253	55.97	20.936	27.72	8.339	25.04
Aug. 7.9	45.78	54.18	54.511	56.05	21.359	26.19	8.562	22.84
17.9	46.44	52.59	54.788	56.11	21.824	24.86	8.812	20.93
27.8	47.14	51.29	55.082	56.15	22.322	23.78	9.084	19.39
Sept. 6.8	47.88	50.30	55.389	56.14	22.844	22.94	9.374	18.29
16.8	48.65	49.66	55.703	56.06	23.386	22.37	9.679	17.69
26.7	49.43	49.48	56.023	55.91	23.937	22.08	9.989	17.61
Oct. 6.7	50.22	49.37	56.345	55.68	24.491	22.07	10.303	18.06
16.7	50.99	49.91	56.664	55.39	25.039	22.35	10.614	19.08
26.7	51.75	50.73	56.976	55.05	25.572	22.92	10.915	20.59
Nov. 5.6	52.46	51.91	57.276	54.67	26.083	23.78	11.202	22.57
15.6	53.12	53.44	57.560	54.29	26.558	24.92	11.465	24.94
25.6	53.70	55.27	57.820	53.92	26.988	26.31	11.701	27.64
Dec. 5.6	54.20	57.38	58.050	53.59	27.360	27.95	11.900	30.56
15.5	54.60	59.70	58.243	53.34	27.666	29.77	12.057	33.60
25.5	54.89	62.16	58.392	53.15	27.894	31.73	12.167	36.64
35.5	55.04	64.71	58.494	53.05	28.036	33.77	12.227	39.62
Mean Place	42.225	63.47	52.098	54.92	18.204	33.52	7.529	34.03
Sec δ , Tan δ	2.836	+2.654	1.083	+0.415	1.944	+1.667	1.155	-0.578
D ϕ α , D ω α	+0.13	+0.01	+0.07	0.00	+0.11	+0.01	+0.05	0.00
D ϕ δ , D ω δ	0.0	+1.0	0.9	+1.0	0.0	+1.0	0.0	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Geminorum. Mag. 3.2			ψ^1 Aurigæ. Mag. 5.1			β Canis Majoris. Mag. 2.0			δ Monocerotis. Mag. 4.5		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m	° '		h m	° '		h m	° '		h m	° '	
	6 17	+22 33		6 18	+49 19		6 19	-17 54		6 19	+ 4 38	
Jan. 0.5	59.052	27.86		34.155	56.57		4.946	49.37		24.633	10.40	
10.5	59.135	27.79		34.254	58.11		4.994	51.74		24.704	9.24	
20.4	59.165	27.80		34.280	59.64		4.994	53.92		24.727	8.21	
30.4	59.144	27.87		34.234	61.10		4.947	55.87		24.703	7.33	
Feb. 9.4	59.075	27.97		34.123	62.43		4.855	57.52		24.634	6.61	
19.3	58.964	28.08		33.954	63.54		4.724	58.87		24.527	6.03	
Mar. 1.3	58.820	28.18		33.737	64.41		4.563	59.89		24.390	5.60	
11.3	58.650	28.25		33.487	64.97		4.382	60.58		24.230	5.33	
21.3	58.469	28.27		33.219	65.21		4.189	60.92		24.059	5.18	
31.2	58.287	28.23		32.950	65.12		3.995	60.93		23.886	5.17	
Apr. 10.2	58.115	28.13		32.696	64.72		3.810	60.61		23.723	5.28	
20.2	57.962	27.99		32.467	64.00		3.643	59.97		23.577	5.53	
30.2	57.839	27.81		32.277	63.02		3.501	59.03		23.458	5.89	
May 10.1	57.751	27.61		32.137	61.80		3.391	57.80		23.371	6.37	
20.1	57.702	27.41		32.051	60.41		3.318	56.32		23.320	6.98	
30.1	57.697	27.23		32.026	58.90		3.284	54.60		23.308	7.71	
June 9.0	57.736	27.08		32.061	57.30		3.291	52.71		23.837	8.53	
19.0	57.818	26.96		32.158	55.68		3.338	50.68		23.406	9.44	
29.0	57.941	26.89		32.313	54.07		3.425	48.56		23.512	10.41	
July 9.0	58.102	26.85		32.522	52.52		3.550	46.42		23.653	11.40	
18.9	58.297	26.85		32.780	51.06		3.709	44.33		23.827	12.39	
28.9	58.523	26.87		33.083	49.71		3.898	42.34		24.029	13.34	
Aug. 7.9	58.774	26.89		33.424	48.50		4.116	40.52		24.255	14.21	
17.9	59.046	26.90		33.795	47.44		4.356	38.97		24.501	14.94	
27.8	59.336	26.87		34.194	46.54		4.616	37.72		24.765	15.52	
Sept. 6.8	59.640	26.80		34.612	45.83		4.891	36.84		25.041	15.89	
16.8	59.953	26.66		35.045	45.29		5.177	36.36		25.327	16.02	
26.7	60.272	26.44		35.488	44.93		5.470	36.34		25.619	15.92	
Oct. 6.7	60.594	26.15		35.935	44.78		5.766	36.77		25.915	15.55	
16.7	60.916	25.80		36.378	44.83		6.061	37.65		26.209	14.93	
26.7	61.232	25.40		36.814	45.10		6.349	38.97		26.498	14.08	
Nov. 5.6	61.537	24.97		37.234	45.57		6.625	40.68		26.778	13.04	
15.6	61.826	24.53		37.628	46.26		6.881	42.71		27.042	11.83	
25.6	62.093	24.11		37.989	47.17		7.114	44.99		27.285	10.51	
Dec. 5.6	62.331	23.73		38.307	48.28		7.316	47.44		27.500	9.15	
15.5	62.531	23.43		38.573	49.55		7.480	49.98		27.680	7.78	
25.5	62.689	23.22		38.779	50.96		7.602	52.53		27.822	6.45	
35.5	62.799	23.10		38.917	52.47		7.678	54.99		27.919	5.21	
Mean Place	56.386	26.30		30.538	54.02		2.655	49.68		22.225	9.54	
Sec δ , Tan δ	1.083	+0.415		1.534	+1.164		1.051	-0.323		1.003	+0.081	
$D\psi\alpha$, $D\omega\alpha$	+0.07	0.00		+0.09	+0.01		+0.05	0.00		+0.06	0.00	
$D\psi\delta$, $D\omega\delta$	0.0	+1.0		0.0	+1.0		0.0	+1.0		0.0	+1.0	

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Argus. (Canopus.) Mag. -0.9		10 Monocerotis. Mag. 5.0		γ Geminorum. Mag. 4.1		δ Lyncis. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 22	° ' " -52 38	h m 6 23	° ' " -4 42	h m 6 24	° ' " +20 15	h m 6 30	° ' " +61 33
Jan. 0.5	9.218	59.91	54.064	35.02	4.729	57.84	11.32	22.60
10.5	9.197 21	63.41 350	54.121 67	36.74 172	4.817 88	57.63 21	11.45 13	24.76 216
20.4	9.103 94	66.69 328	54.141 20	38.29 155	4.853 36	57.49 14	11.48 3	26.91 215
30.4	8.943 180	69.65 296	54.114 27	39.65 136	4.837 16	57.44 5	11.42 6	28.96 205
Feb. 9.4	8.722 221	72.22 257	54.042 72	40.80 115	4.774 63	57.44 0	11.25 17	30.83 187
19.4	8.450 272	74.35 213	53.932 110	41.74 94	4.669 105	57.48 4	11.01 24	32.43 160
Mar. 1.3	8.137 313	76.00 165	53.792 140	42.43 69	4.531 138	57.53 5	10.71 30	33.69 126
11.3	7.795 342	77.13 113	53.628 164	42.91 48	4.366 165	57.58 5	10.36 35	34.56 87
21.3	7.437 358	77.74 61	53.454 174	43.15 24	4.188 178	57.60 2	9.98 38	35.03 47
31.2	7.078 359	77.83 9	53.277 177	43.17 2	4.008 180	57.59 1	9.59 39	35.04 1
Apr. 10.2	6.730 348	77.40 43	53.109 168	42.97 20	3.838 170	57.55 4	9.22 37	34.62 42
20.2	6.403 327	76.46 94	52.957 152	42.57 40	3.685 153	57.47 8	8.88 34	33.78 84
30.2	6.109 294	75.06 140	52.831 126	41.97 60	3.560 125	57.39 8	8.58 30	32.56 122
May 10.1	5.857 252	73.22 184	52.735 96	41.16 81	3.468 92	57.29 10	8.35 23	31.01 155
20.1	5.654 203	70.98 224	52.675 60	40.18 98	3.416 52	57.21 8	8.20 15	29.21 180
30.1	5.506 148	68.41 257	52.653 22	39.03 115	3.405 11	57.15 6	8.11 9	27.20 201
June 9.1	5.417 89	65.57 284	52.672 19	37.76 127	3.437 32	57.11 4	8.11 0	25.03 217
19.0	5.388 29	62.52 305	52.729 57	36.37 139	3.512 75	57.12 1	8.19 8	22.79 224
29.0	5.419 31	59.37 315	52.823 146	34.91 146	3.627 115	57.16 4	8.35 16	20.54 225
July 9.0	5.512 98	56.18 319	52.953 180	33.42 149	3.779 152	57.24 8	8.58 23	18.32 222
18.9	5.662 150	53.06 312	53.115 162	31.95 147	3.965 186	57.34 10	8.90 32	16.20 212
28.9	5.867 205	50.10 296	53.306 191	30.55 140	4.182 217	57.45 11	9.27 37	14.20 200
Aug. 7.9	6.123 256	47.39 271	53.523 217	29.28 127	4.424 242	57.55 10	9.69 42	12.38 182
17.9	6.423 300	45.02 237	53.761 238	28.19 109	4.688 264	57.62 7	10.16 47	10.77 161
27.8	6.761 338	43.10 192	54.017 256	27.32 87	4.969 281	57.64 2	10.67 51	9.37 140
Sept. 6.8	7.130 369	41.70 140	54.286 269	26.73 59	5.265 296	57.58 6	11.22 55	8.24 113
16.8	7.523 393	40.86 84	54.567 281	26.46 27	5.573 308	57.44 14	11.79 57	7.37 87
26.8	7.929 406	40.63 23	54.855 288	26.51 5	5.886 313	57.20 24	12.37 58	6.80 57
Oct. 6.7	8.340 411	41.06 43	55.146 291	26.91 40	6.203 317	56.87 23	12.96 59	6.53 27
16.7	8.746 406	42.12 106	55.437 291	27.65 74	6.521 318	56.44 43	13.55 59	6.56 3
26.7	9.135 389	43.80 168	55.723 286	28.71 106	6.834 313	55.94 50	14.14 59	6.92 36
Nov. 5.6	9.498 363	46.04 224	56.000 277	30.05 134	7.136 302	55.39 55	14.70 56	7.61 69
15.6	9.826 328	48.78 274	56.261 261	31.63 175	7.425 289	54.82 57	15.23 53	8.60 99
25.6	10.105 275	51.92 314	56.501 240	33.38 175	7.691 296	54.25 57	15.71 48	9.91 131
Dec. 5.6	10.330 229	55.35 343	56.712 211	35.24 186	7.930 239	53.71 54	16.14 43	11.50 159
15.5	10.492 162	58.96 361	56.890 178	37.14 190	8.132 202	53.24 47	16.50 36	13.31 181
25.5	10.585 93	62.62 366	57.027 137	39.02 188	8.294 162	52.86 38	16.77 27	15.31 200
35.5	10.609 24	66.22 390	57.121 94	40.82 180	8.408 114	52.58 28	16.95 18	17.45 214
Mean Place	6.565	60.04	51.718	35.53	2.105	56.75	6.605	20.84
Sec δ , Tan δ	1.648	-1.310	1.003	-0.082	1.066	+0.369	2.099	+1.846
$D_{\psi} \alpha$, $D_{\psi} \delta$	+0.03	-0.01	+0.06	0.00	+0.07	0.00	+0.11	+0.02
$D_{\psi} \delta$, $D_{\psi} \delta$	0.0	+1.0	0.0	+1.0	0.0	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Canis Majoris. Mag. 4.5			23 H. Camelop. Mag. 5.6			51 Aurigæ. Mag. 5.7			γ Geminorum. Mag. 1.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 6 81	s 6 81	° ' " -22 53	h m 6 32	s 6 32	° ' " +79 39	h m 6 32	s 6 32	° ' " +39 27	h m 6 32	s 6 32	° ' " +16 28
Jan. 0.5	36.979	56	51.59	16.68	19	27.96	57.687	110	55.71	57.628	93	16.58
10.5	37.035	4	54.23	16.87	291	30.87	57.797	94	56.85	57.721	43	16.10
20.4	37.039	45	56.70	16.81	6	33.73	57.845	100	57.65	57.764	38	15.72
30.4	36.994	91	58.91	16.52	29	36.44	57.831	14	58.64	57.756	8	15.46
Feb. 9.4	36.908	131	60.83	15.98	54	38.88	57.759	72	59.59	57.700	56	15.28
19.4	36.772	165	62.41	15.25	73	40.96	57.634	125	60.43	57.603	97	15.18
Mar. 1.3	36.607	187	63.63	14.36	89	42.59	57.466	168	61.12	57.470	133	15.13
11.3	36.420	201	64.48	13.34	102	43.72	57.268	198	61.82	57.312	158	15.11
21.3	36.219	204	64.97	12.25	109	44.30	57.049	219	61.89	57.140	172	15.11
31.2	36.015	197	65.06	11.14	111	44.29	56.827	222	61.94	56.964	176	15.12
Apr. 10.2	35.818	181	64.80	10.06	108	43.73	56.614	213	61.75	56.795	160	15.14
20.2	35.637	157	64.18	9.06	100	42.63	56.420	194	61.35	56.643	152	15.16
30.2	35.480	126	63.22	8.17	89	41.05	56.258	162	60.75	56.517	126	15.20
May 10.1	35.354	91	61.94	7.42	75	39.03	56.136	122	59.96	56.421	96	15.25
20.1	35.263	52	60.37	6.86	56	36.67	56.059	77	59.05	56.364	57	15.34
30.1	35.211	11	58.56	6.49	37	34.01	56.031	22	58.04	56.346	101	15.47
June 9.1	35.200	30	56.52	6.32	17	31.17	56.053	22	56.97	56.369	107	15.63
19.0	35.230	70	54.34	6.38	6	28.21	56.127	74	55.86	56.433	111	15.84
29.0	35.300	109	52.05	6.63	25	25.22	56.250	123	54.76	56.537	110	16.10
July 9.0	35.409	144	49.73	7.10	47	22.26	56.419	169	53.69	56.676	107	16.37
18.9	35.553	178	47.44	7.76	66	19.41	56.630	211	52.66	56.850	103	16.65
28.9	35.731	208	45.27	8.60	84	16.75	56.878	248	51.69	57.053	97	16.92
Aug. 7.9	35.939	233	43.27	9.59	99	14.31	57.158	280	50.80	57.282	97	17.15
17.9	36.172	256	41.54	10.72	113	12.16	57.467	309	49.99	57.534	89	17.34
27.8	36.428	274	40.12	11.97	125	10.32	57.799	332	49.27	57.804	81	17.44
Sept. 6.8	36.702	287	39.09	13.33	136	8.85	58.150	351	48.62	58.088	72	17.43
16.8	36.989	297	38.51	14.75	142	7.76	58.515	365	48.05	58.384	65	17.31
26.8	37.286	303	38.40	16.22	147	7.08	58.891	376	47.58	58.690	57	17.03
Oct. 6.7	37.589	303	38.79	17.71	149	6.83	59.273	382	47.21	59.000	47	16.63
16.7	37.892	297	39.67	19.20	145	7.02	59.656	383	46.96	59.312	37	16.11
26.7	38.189	287	41.03	20.65	145	7.66	60.035	379	46.82	59.621	25	15.46
Nov. 5.6	38.476	268	42.81	22.02	137	8.73	60.404	369	46.81	59.921	14	14.72
15.6	38.744	245	44.97	23.31	129	10.24	60.755	351	46.95	60.209	1	13.94
25.6	38.989	213	47.41	24.47	116	12.13	61.082	327	47.26	60.476	288	13.13
Dec. 5.6	39.202	175	50.08	25.46	99	14.38	61.375	293	47.72	60.717	31	12.34
15.5	39.377	131	52.85	26.25	79	16.93	61.626	261	48.35	60.923	241	11.62
25.5	39.508	85	55.65	26.83	58	19.68	61.826	200	49.13	61.089	166	10.96
35.5	39.593		58.38	27.16	33	22.56	61.970	144	50.01	61.209	88	10.41
Mean Place	34.686		51.86	5.571		25.93	54.535		54.79	55.063		16.07
Sec δ , Tan δ	1.086		-0.422	5.570		+5.479	1.295		+0.823	1.043		+0.296
$D\psi a$, $D_\omega a$	+0.05		0.00	+0.20		+0.05	+0.08		+0.01	+0.07		0.00
$D\psi \delta$, $D_\omega \delta$	-0.1		+1.0	-0.1		+1.0	-0.1		+1.0	-0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 3.2		β Monocerotis. Mag. 4.7		ε Geminorum. Mag. 3.2		ξ Geminorum. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 35	° ' " -43 7	h m 6 36	° ' " + 9 58	h m 6 38	° ' " +25 12	h m 6 40	° ' " +12 59
	s	"	s	"	s	"	s	"
Jan. 0.5	15.825	21.06	26.918	24.77	52.322	52.19	40.411	10.10
10.5	15.851 ²⁶	24.44 ³³⁸	27.009 ⁹¹	23.88 ⁸⁹	52.428 ¹⁰⁶	52.24 ⁵	40.508 ⁹⁷	9.38 ⁷²
20.4	15.815 ³⁶	27.61 ³¹⁷	27.061 ⁴²	23.12 ⁷⁶	52.481 ⁵³	52.39 ¹⁵	40.556 ⁴⁸	8.78 ⁶⁰
30.4	15.719 ⁹⁶	30.50 ²⁸⁹	27.044 ⁷	22.49 ⁶³	52.478 ³	52.62 ²³	40.554 ²	8.31 ⁴⁷
Feb. 9.4	15.570 ¹⁴⁹	33.03 ²⁵³	26.991 ⁵³	21.99 ⁵⁰	52.425 ⁵³	52.89 ²⁷	40.504 ⁵⁰	7.95 ³⁶
	197	213	94	37	99	28	92	24
19.4	15.373	35.16	26.897	21.62	52.326	53.17	40.412	7.71
Mar. 1.3	15.138 ²³⁵	36.84 ¹⁶⁸	26.768 ¹²⁹	21.36 ²⁶	52.190 ¹³⁶	53.42 ²⁵	40.285 ¹²⁷	7.54 ¹⁷
	263	120	154	8	164	21	153	9
11.3	14.875 ²⁷⁸	38.04 ⁷²	26.614 ¹⁰⁹	21.20 ¹⁶	52.026 ¹⁸¹	53.63 ¹⁵	40.132 ¹⁷⁰	7.45 ⁴
21.3	14.597 ²⁸³	38.76 ²²	26.445 ¹⁷²	21.12 ⁰	51.845 ¹⁸⁶	53.78 ⁶	39.962 ¹⁷³	7.41 ²
31.3	14.314 ²⁷⁷	38.98 ²⁶	26.273 ¹⁶⁶	21.12 ⁶	51.659 ¹⁸⁰	53.84 ³	39.789 ¹⁶⁸	7.43 ⁵
Apr. 10.2	14.037	38.72	26.107	21.18	51.479	53.81	39.621	7.48
20.2	13.778 ²⁵⁹	37.99 ⁷⁸	25.956 ¹⁵¹	21.32 ¹⁴	51.316 ¹⁶⁸	53.70 ¹¹	39.468 ¹⁵³	7.57 ⁹
30.2	13.545 ²³³	36.80 ¹¹⁹	25.830 ¹²⁶	21.55 ²³	51.178 ¹³⁸	53.52 ¹⁸	39.340 ¹²⁸	7.70 ¹³
May 10.1	13.347 ¹⁹⁶	35.19 ¹⁶¹	25.734 ⁹⁶	21.83 ²⁶	51.075 ¹⁰⁸	53.27 ²⁵	39.241 ⁹⁹	7.88 ¹³
20.1	13.189 ¹⁵⁸	33.20 ¹⁹⁹	25.674 ⁶⁰	22.19 ³⁶	51.010 ⁶⁵	52.99 ²⁸	39.178 ⁶³	8.12 ²⁴
	111	230	22	44	24	30	25	29
30.1	13.078	30.90	25.652	22.63	50.966	52.69	39.153	8.41
June 9.1	13.014 ⁶⁴	28.31 ²⁵⁹	25.669 ¹⁷	23.14 ⁵¹	51.006 ²⁰	52.38 ³¹	39.168 ¹⁵	8.74 ³³
19.0	13.000 ¹⁴	25.52 ²⁷⁰	25.726 ⁸⁷	23.70 ⁵⁶	51.068 ⁶²	52.08 ³⁰	39.223 ⁵⁵	9.13 ³⁹
29.0	13.037 ³⁷	22.59 ²⁹³	25.821 ⁹⁶	24.31 ⁶¹	51.173 ¹⁰⁶	51.80 ²⁸	39.315 ⁹²	9.55 ⁴²
July 9.0	13.123 ⁸⁶	19.62 ²⁹⁷	25.952 ¹³¹	24.95 ⁶⁴	51.315 ¹⁴²	51.63 ²⁷	39.445 ¹³⁰	10.00 ⁴⁵
	133	294	168	64	179	23	163	45
19.0	13.256	16.68	26.115	25.59	51.494	51.30	39.608	10.45
28.9	13.434 ¹⁷⁸	13.86 ²⁸²	26.307 ¹⁹²	26.20 ⁶¹	51.705 ²¹¹	51.07 ²³	39.799 ¹⁹¹	10.87 ⁴²
Aug. 7.9	13.654 ²²⁰	11.28 ²⁵⁸	26.526 ²¹⁹	26.75 ⁵⁵	51.943 ²³⁸	50.84 ²³	40.017 ²¹⁸	11.25 ³⁸
17.9	13.910 ²⁵⁶	9.00 ²²⁸	26.766 ²⁴⁰	27.21 ⁴⁶	52.206 ²⁶³	50.59 ²⁵	40.258 ²⁴¹	11.55 ³⁰
27.8	14.197 ²⁸⁷	7.12 ¹⁸⁸	27.025 ²⁵⁹	27.54 ³³	52.488 ²⁸²	50.33 ²⁶	40.518 ²⁶⁰	11.73 ¹⁸
	315	141	274	15	300	30	275	5
Sept. 6.8	14.512	5.71	27.299	27.69	52.788	50.03	40.793	11.78
16.8	14.847 ³³⁵	4.84 ⁸⁷	27.585 ²⁹⁶	27.68 ¹	53.101 ³¹³	49.68 ³⁵	41.081 ²⁸⁸	11.68 ¹⁰
26.8	15.197 ³⁵⁰	4.55 ²⁹	27.880 ²⁹⁵	27.46 ²²	53.423 ³²²	49.29 ³⁹	41.379 ²⁹⁸	11.41 ²⁷
Oct. 6.7	15.554 ³⁵⁷	4.86 ³¹	28.181 ³⁰¹	27.04 ⁴²	53.751 ³²⁸	48.86 ⁴³	41.684 ³⁰⁵	10.98 ⁴³
16.7	15.910 ³⁵⁶	5.80 ⁹⁴	28.484 ³⁰³	26.42 ⁶²	54.083 ³³²	48.38 ⁴⁸	41.991 ³⁰⁷	10.36 ⁶²
	346	152	300	79	329	50	304	77
26.7	16.256	7.32	28.784	25.63	54.412	47.88	42.295	9.59
Nov. 5.7	16.587 ³³¹	9.39 ²⁰⁷	29.077 ²⁹³	24.68 ⁹⁵	54.734 ³²²	47.38 ⁵⁰	42.593 ²⁹⁸	8.71 ⁸⁸
15.6	16.891 ³⁰⁴	11.94 ²⁵⁵	29.358 ²⁸¹	23.62 ¹⁰⁶	55.042 ³⁰⁶	46.90 ⁴⁸	42.881 ²⁸⁸	7.74 ⁹⁷
25.6	17.161 ²⁷⁰	14.89 ²⁹⁵	29.618 ²⁶⁰	22.50 ¹¹²	55.330 ²⁸⁸	46.48 ⁴²	43.148 ²⁶⁷	6.72 ¹⁰²
Dec. 5.6	17.389 ²²⁸	18.12 ³²³	29.854 ²³⁶	21.35 ¹¹⁵	55.590 ²⁶⁰	46.13 ³⁵	43.390 ²⁴²	5.71 ¹⁰¹
	178	342	202	113	225	23	209	98
15.5	17.567	21.54	30.056	20.22	55.815	45.90	43.599	4.73
25.5	17.689 ¹²²	25.04 ³⁵⁰	30.218 ¹⁶²	19.15 ¹⁰⁷	55.998 ¹⁸³	45.77 ¹³	43.768 ¹⁶⁹	3.83 ⁹⁰
35.5	17.751 ⁶²	28.49 ³⁴⁵	30.336 ¹¹⁸	18.19 ⁹⁶	56.132 ¹³⁴	45.75 ²	43.892 ¹²⁴	3.03 ⁸⁰
Mean Place	13.382	21.57	24.445	24.51	49.590	51.95	37.896	10.03
Sec δ, Tan δ	1.370	-0.937	1.015	+0.176	1.105	+0.471	1.026	+0.231
D _α α, D _α α	+0.04	-0.01	+0.07	0.00	+0.07	+0.01	+0.07	0.00
D _δ δ, D _δ δ	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ^5 Aurigæ. Mag. 5.3		α Canis Majoris. (Sirius.) Mag. -1.6		18 Monocerotis. Mag. 4.7		43 Camelop. Mag. 5.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 40	° ' " +43 39	h m 6 41	° ' " -16 35	h m 6 43	° ' " + 2 30	h m 6 44	° ' " +68 58
	s	"	s	"	s	"	s	"
Jan. 0.5	48.952	41.00	31.581	65.99	34.356	14.19	51.86	72.53
10.5	49.077	42.19	31.648	68.42	34.448	12.82	52.04	75.02
20.4	49.135	43.42	31.666	70.67	34.492	11.61	52.09	77.52
30.4	49.126	44.66	31.635	72.67	34.487	10.56	52.02	79.92
Feb. 9.4	49.055	45.83	31.559	74.41	34.436	9.68	51.81	82.15
19.4	48.927	46.89	31.442	75.86	34.345	8.99	51.51	84.10
Mar. 1.3	48.752	47.77	31.292	76.97	34.218	8.47	51.12	85.69
11.3	48.542	48.42	31.118	77.76	34.067	8.11	50.65	86.84
21.3	48.311	48.82	30.931	78.23	33.899	7.93	50.14	87.54
31.3	48.072	48.95	30.739	78.37	33.728	7.89	49.61	87.74
Apr. 10.2	47.840	48.80	30.553	78.18	33.561	8.00	49.10	87.45
20.2	47.628	48.40	30.383	77.70	33.408	8.28	48.62	86.67
30.2	47.447	47.73	30.235	76.91	33.278	8.64	48.18	85.45
May 10.1	47.306	46.87	30.117	75.85	33.176	9.16	47.82	83.83
20.1	47.212	45.83	30.033	74.54	33.109	9.82	47.55	81.88
30.1	47.170	44.64	29.986	73.02	33.078	10.59	47.39	79.66
June 9.1	47.181	43.37	29.979	71.30	33.085	11.46	47.33	77.24
19.0	47.246	42.04	30.011	69.44	33.130	12.41	47.36	74.71
29.0	47.363	40.69	30.082	67.49	33.213	13.42	47.51	72.10
July 9.0	47.530	39.37	30.190	65.52	33.331	14.46	47.76	69.51
19.0	47.742	38.08	30.332	63.57	33.482	15.49	48.10	67.00
28.9	47.995	36.86	30.506	61.71	33.661	16.48	48.53	64.60
Aug. 7.9	48.283	35.72	30.709	60.02	33.867	17.37	49.04	62.37
17.9	48.603	34.66	30.935	58.55	34.095	18.12	49.62	60.37
27.8	48.950	33.72	31.182	57.38	34.342	18.70	50.26	58.63
Sept. 6.8	49.316	32.89	31.447	56.56	34.607	19.06	50.94	57.15
16.8	49.700	32.18	31.726	56.13	34.884	19.17	51.67	55.98
26.8	50.097	31.59	32.014	56.12	35.171	19.02	52.43	55.16
Oct. 6.7	50.502	31.14	32.309	56.57	35.465	18.59	53.20	54.70
16.7	50.909	30.86	32.605	57.46	35.762	17.88	53.98	54.59
26.7	51.313	30.72	32.898	58.77	36.057	16.93	54.74	54.88
Nov. 5.7	51.707	30.77	33.182	60.47	36.346	15.75	55.47	55.56
15.6	52.085	31.01	33.449	62.51	36.623	14.39	56.17	56.61
25.6	52.436	31.43	33.695	64.80	36.881	12.91	56.82	58.02
Dec. 5.6	52.752	32.07	33.912	67.26	37.115	11.35	57.39	59.78
15.5	53.024	32.88	34.094	69.84	37.316	9.77	57.87	61.83
25.5	53.243	33.87	34.235	72.41	37.478	8.24	58.24	64.09
35.5	53.404	34.98	34.330	74.92	37.596	6.80	58.48	66.53
Mean Place	45.621	40.70	29.433	65.39	31.963	14.20	45.850	72.22
Sec. δ , Tan δ	1.382	+0.954	1.044	-0.298	1.001	+0.044	2.788	+2.603
$D\psi\alpha$, $D_\alpha\alpha$	+0.09	+0.01	+0.05	0.00	+0.06	0.00	+0.13	+0.03
$D\psi\delta$, $D_\alpha\delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Geminorum. Mag. 3.6			α Pictoris. Mag. 3.3			τ Argus. Mag. 2.8			15 Lynx. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h	m	'	h	m	'	h	m	'	h	m	'
	6	47	+34 3	6	47	-61 50	6	47	-50 30	6	50	+58 31
	s		"	s		"	s		"	s		"
Jan. 0.5	22.212	123	44.67	23.50	2	66.50	55.166	26	55.23	10.180	162	58.69
10.5	22.335	65	45.26	23.48	2	70.22	55.192	359	58.82	10.342	70	60.67
20.5	22.400		45.93	23.37	11	73.76	55.147	341	62.23	10.412	21	62.69
30.4	22.405	5	46.66	23.17	20	77.05	55.035	315	65.38	10.391	21	64.68
Feb. 9.4	22.352	58	47.39	22.90	27	79.97	54.862	173	68.18	10.284	107	66.55
	102		68	84		252	228	289		185		165
19.4	22.250		48.07	22.56		82.49	54.634		70.57	10.099		68.20
Mar. 1.3	22.106	144	48.67	22.16	40	84.53	54.361	273	72.51	9.849	250	69.59
11.3	21.929	177	49.15	21.72	44	86.07	54.054	307	73.96	9.548	301	70.63
21.3	21.732	197	49.45	21.25	47	87.09	53.728	326	74.89	9.216	332	71.28
31.3	21.528	204	49.60	20.77	48	87.56	53.393	335	75.32	8.871	345	71.52
	199		4	48		5	331	8		341		17
Apr. 10.2	21.329		49.56	20.29		87.51	53.062		75.24	8.530		71.35
20.2	21.146	183	49.35	19.84	45	86.93	52.748	314	74.65	8.214	316	70.78
30.2	20.990	156	48.98	19.41	43	85.84	52.459	289	73.57	7.935	279	69.84
May 10.2	20.868	122	48.46	19.03	38	84.27	52.206	263	72.05	7.707	228	68.56
20.1	20.787	81	47.84	18.71	32	82.27	51.994	212	70.10	7.540	167	66.99
	36		73	26		238	162	229		99		179
30.1	20.751		47.11	18.45		79.89	51.832		67.81	7.441		65.20
June 9.1	20.761	10	46.34	18.25	20	77.17	51.728	109	65.20	7.413	28	63.23
19.0	20.817	56	45.53	18.12	13	74.19	51.668	55	62.35	7.459	46	61.15
29.0	20.919	102	44.71	18.08	4	71.05	51.671	3	59.33	7.576	302	59.01
July 9.0	21.063	144	43.90	18.12	4	67.82	51.730	59	56.24	7.763	187	56.87
	183		79	11		822	115	307		251		209
19.0	21.246		43.11	18.23		64.60	51.845		53.17	8.014		54.78
28.9	21.466	220	42.35	18.41	18	61.48	52.012	167	50.19	8.324	310	52.77
Aug. 7.9	21.717	251	41.61	18.66	25	58.56	52.229	217	47.42	8.687	363	50.88
17.9	21.994	277	40.93	18.98	32	55.96	52.493	264	44.95	9.097	410	49.15
27.9	22.296	302	40.26	19.36	38	53.75	52.797	304	42.87	9.547	450	47.61
	320		63	43		173	338	180		483		123
Sept. 6.8	22.616		39.63	19.79		52.02	53.135		41.27	10.030		46.28
16.8	22.951	335	39.03	20.26	47	50.86	53.500	365	40.21	10.541	511	45.19
26.8	23.300	349	38.46	20.75	49	50.31	53.886	386	39.75	11.070	529	44.34
Oct. 6.7	23.657	357	37.93	21.26	51	50.42	54.283	397	39.91	11.613	543	43.77
16.7	24.017	360	37.46	21.77	51	51.19	54.681	398	40.71	12.162	549	43.49
	360		40	49		142	392	145		545		2
26.7	24.377		37.06	22.26		52.61	55.073		42.16	12.707		43.51
Nov. 5.7	24.729	352	36.75	22.73	47	54.63	55.446	373	44.18	13.239	532	43.84
15.6	25.069	340	36.55	23.16	43	57.21	55.790	344	46.72	13.747	508	44.50
25.6	25.387	318	36.48	23.52	36	60.25	56.096	306	49.71	14.220	473	45.45
Dec. 5.6	25.677	290	36.55	23.82	30	63.65	56.353	257	53.02	14.644	424	46.71
	252		23	22		364	200	356		364		152
15.6	25.929		36.78	24.04		67.29	56.553		56.58	15.008		48.23
25.5	26.135	206	37.15	24.17	13	71.06	56.689	136	60.24	15.299	291	49.98
35.5	26.288	153	37.66	24.21	4	74.84	56.758	69	63.90	15.509	210	51.89
Mean Place	19.245		45.02	20.476		67.91	52.585		56.32	5.803		59.14
Sec δ , Tan δ	1.207		+0.676	2.120		-1.869	1.573		-1.214	1.916		+1.634
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.08		+0.01	+0.01		-0.03	+0.03		-0.02	+0.10		+0.02
$D_{\psi} \delta$, $D_{\omega} \delta$	-0.1		+1.0	-0.1		+1.0	-0.1		+1.0	-0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Canis Majoris. Mag. 4.2		ϵ Canis Majoris. Mag. 1.6		ζ Geminorum. Var. 3.7-4.3		α Canis Majoris. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 50	° ' " -11 55	h m 6 55	° ' " -28 51	h m 6 59	° ' " +20 41	h m 6 59	° ' " -23 42
	s	"	s	"	s	"	s	"
Jan. 0.5	22.348 ⁸⁶	61.18	24.117 ⁷⁵	29.51 ²⁹⁹	13.884 ¹²³	33.99 ²⁸	35.801 ⁸⁵	39.88 ²⁷⁹
10.5	22.434 ³⁷	63.38 ²²⁰	24.192 ²⁰	32.50 ²⁸³	14.007 ⁷¹	33.71 ¹⁶	35.886 ³³	42.67 ²⁶²
20.5	22.471 ¹²	65.40 ¹⁸²	24.212 ³³	35.33 ²⁵⁷	14.078 ¹⁸	33.55 ⁴	35.919 ²⁰	45.29 ²⁴⁰
30.4	22.459 ⁵⁸	67.22 ¹⁵⁷	24.179 ⁸³	37.90 ²²⁹	14.066 ⁸⁴	33.51 ⁵	35.899 ⁶⁸	47.69 ²¹¹
Feb. 9.4	22.401 ¹⁰⁰	68.79 ¹³¹	24.096 ¹²⁷	40.19 ¹⁹³	14.062 ⁸⁰	33.56 ¹²	35.831 ¹¹²	49.80 ¹⁷⁹
19.4	22.301 ¹³⁴	70.10 ¹⁰²	23.969 ¹⁶⁴	42.12 ¹⁵⁶	13.982 ¹²⁰	33.68 ¹⁵	35.719 ¹⁴⁶	51.59 ¹⁴⁵
Mar. 1.3	22.167 ¹⁶⁰	71.12 ⁷³	23.805 ¹⁹²	43.68 ¹¹⁶	13.862 ¹⁴⁹	33.83 ¹⁷	35.573 ¹⁷⁷	53.04 ¹⁰⁸
11.3	22.007 ¹⁷⁶	71.85 ⁴⁵	23.813 ²¹⁰	44.84 ⁷⁶	13.713 ¹⁷⁰	34.00 ¹⁵	35.396 ¹⁹³	54.12 ⁶⁹
21.3	21.831 ¹⁸³	72.30 ¹⁵	23.403 ²¹⁷	45.60 ³³	13.543 ¹⁷⁸	34.15 ¹²	35.203 ²⁰⁸	54.81 ³³
31.3	21.648 ¹⁷⁸	72.45 ¹²	23.186 ²¹⁴	45.93 ⁷	13.365 ¹⁷⁵	34.27 ⁹	35.000 ²⁰⁰	55.14 ⁵
Apr. 10.2	21.470 ¹⁶⁵	72.33 ³⁹	22.972 ²⁰²	45.86 ⁴⁶	13.190 ¹⁶²	34.36 ⁸	34.800 ¹⁸⁹	55.09 ⁴²
20.2	21.305 ¹⁴⁵	71.94 ⁹⁰	22.770 ¹⁸²	45.40 ⁸⁵	13.028 ¹⁴¹	34.39 ⁰	34.611 ¹⁶⁸	54.67 ⁷⁷
30.2	21.160 ¹¹⁷	71.28 ⁶⁶	22.588 ¹⁵³	44.55 ¹²³	12.887 ¹¹¹	34.39 ⁶	34.443 ¹⁴³	53.90 ¹¹¹
May 10.2	21.043 ⁸⁵	70.38 ¹¹⁴	22.435 ¹¹⁹	43.33 ¹⁵⁵	12.776 ⁷⁷	34.36 ⁸	34.300 ¹¹⁰	52.79 ¹³⁸
20.1	20.958 ⁵⁰	69.24 ¹³³	22.316 ⁸³	41.78 ¹⁸⁴	12.699 ³⁸	34.30 ⁷	34.190 ⁷⁴	51.41 ¹⁶⁸
30.1	20.908 ¹¹	67.91 ¹⁵⁰	22.233 ⁴³	39.94 ²¹⁰	12.661 ⁰	34.23 ⁷	34.116 ³⁶	49.73 ¹⁹⁰
June 9.1	20.897 ³⁷	66.41 ¹⁶⁵	22.190 ²	37.84 ²²⁸	12.661 ⁴¹	34.16 ⁷	34.080 ³	47.83 ²⁰⁹
19.0	20.924 ⁶⁴	64.76 ¹⁷³	22.188 ⁴⁰	35.56 ²⁴²	12.702 ⁸¹	34.09 ⁶	34.083 ⁴³	45.74 ²²⁰
29.0	20.988 ⁹⁹	63.03 ¹⁷⁸	22.228 ⁸⁰	33.14 ²⁴⁹	12.783 ¹¹⁹	34.03 ⁶	34.126 ⁸¹	43.54 ²²⁸
July 9.0	21.087 ¹³⁴	61.25 ¹⁷⁶	22.308 ¹¹⁹	30.65 ²⁴⁸	12.902 ¹⁵³	33.97 ⁶	34.207 ¹¹⁸	41.26 ²²⁷
19.0	21.221 ¹⁶⁵	59.49 ¹⁶⁸	22.427 ¹⁵⁴	28.17 ²³⁹	13.055 ¹⁸⁴	33.91 ⁸	34.325 ¹⁵³	38.99 ²¹⁹
28.9	21.386 ¹⁹²	57.81 ¹⁵⁵	22.581 ¹⁸⁷	25.78 ²²²	13.239 ²¹³	33.83 ¹⁰	34.478 ¹⁸⁴	36.80 ²⁰²
Aug. 7.9	21.578 ²¹⁷	56.26 ¹³⁶	22.768 ²¹⁹	23.56 ¹⁹⁷	13.452 ²³⁸	33.73 ¹⁵	34.662 ²¹²	34.78 ¹⁸²
17.9	21.795 ²³⁹	54.90 ¹⁰⁹	22.987 ²⁴⁵	21.59 ¹⁶⁵	13.690 ²⁶⁰	33.58 ²²	34.874 ²³⁶	32.96 ¹⁴⁹
27.9	22.034 ²⁵⁷	53.81 ⁷⁹	23.232 ²⁶⁹	19.94 ¹²⁴	13.950 ²⁷⁸	33.36 ²⁹	35.110 ²⁶⁰	31.47 ¹¹³
Sept. 6.8	22.291 ²⁷²	53.02 ⁴²	23.501 ²⁸⁶	18.70 ⁷⁹	14.228 ²⁸⁸	33.07 ³⁹	35.370 ²⁷⁸	30.34 ⁷¹
16.8	22.563 ²⁸⁴	52.60 ⁵	23.787 ³⁰³	17.91 ²⁹	14.521 ³⁰⁷	32.68 ⁴⁸	35.648 ²⁹¹	29.63 ²³
26.8	22.847 ²⁹²	52.55 ³⁹	24.090 ³¹²	17.62 ²⁴	14.828 ³¹⁶	32.20 ⁵⁷	35.939 ³⁰⁴	29.40 ²⁵
Oct. 6.7	23.139 ²⁹⁶	52.94 ⁷⁶	24.402 ³¹⁶	17.86 ⁷⁸	15.144 ³²²	31.63 ⁶⁷	36.243 ³⁰⁷	29.65 ⁷⁶
16.7	23.435 ²⁹⁵	53.70 ¹¹⁷	24.718 ³¹⁵	18.64 ¹³⁰	15.466 ³²³	30.96 ⁷⁴	36.550 ³⁰⁷	30.41 ¹²⁵
26.7	23.730 ²⁸⁸	54.87 ¹⁵³	25.033 ³⁰⁶	19.94 ¹⁷⁹	15.789 ³¹⁹	30.22 ⁷⁷	36.857 ³⁰¹	31.66 ¹⁷¹
Nov. 5.7	24.018 ²⁷⁶	56.40 ¹⁸²	25.339 ²⁹¹	21.73 ²²²	16.108 ³⁰⁹	29.45 ⁷⁹	37.158 ²⁸⁷	33.37 ²¹⁰
15.6	24.294 ²⁵⁷	58.22 ²⁰⁷	25.630 ²⁶⁷	23.95 ²⁵⁷	16.417 ²⁹³	28.66 ⁷⁷	37.445 ²⁶⁶	35.47 ²⁴²
25.6	24.551 ²³¹	60.29 ²²⁴	25.897 ²³⁸	26.52 ²⁸³	16.710 ²⁶⁸	27.89 ⁷⁰	37.711 ²³⁹	37.89 ²⁶⁸
Dec. 5.6	24.782 ¹⁹⁷	62.53 ²³²	26.135 ¹⁹⁹	29.35 ³⁰²	16.978 ²³⁶	27.19 ⁶¹	37.950 ²⁰³	40.57 ²⁸²
15.6	24.979 ¹⁵⁷	64.85 ²³³	26.334 ¹⁵³	32.37 ³⁰⁸	17.214 ¹⁹⁸	26.58 ⁵⁰	38.153 ¹⁶⁰	43.39 ²⁸⁹
25.5	25.136 ¹¹³	67.18 ²²⁶	26.487 ¹⁰⁴	35.45 ³⁰⁵	17.412 ¹⁵⁰	26.08 ³⁷	38.313 ¹¹⁴	46.28 ²⁸⁵
35.5	25.249	69.44	26.591	38.50	17.562	25.71	38.427	49.13
Mean Place	20.048	61.24	21.817	30.10	11.248	35.05	33.520	40.29
Sec δ , Tan δ	1.022	-0.211	1.142	-0.551	1.069	+0.378	1.092	-0.439
$D\psi\alpha$, $D_\omega\alpha$	+0.06	0.00	+0.05	-0.01	+0.07	+0.01	+0.05	-0.01
$D\psi\delta$, $D_\omega\delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Canis Majoris. Mag. 4.1		δ Canis Majoris. Mag. 2.0		63 Aurigæ. Mag. 5.1		51 Geminorum. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 0	° ' " -15 30	h m 7 5	° ' " -26 15	h m 7 5	° ' " +39 27	h m 7 8	° ' " +16 17
	s	"	s	"	s	"	s	"
Jan. 0.5	2.506 ⁹²	35.19 ²⁴¹	3.215 ⁸⁸	37.80 ²⁹²	60.139 ¹⁵¹	23.73 ⁸⁷	38.969 ¹²⁸	61.50 ⁶⁰
10.5	2.598 ⁴³	37.60 ²²⁵	3.303 ³⁵	40.72 ²⁷⁶	60.290 ⁸⁸	24.60 ⁹⁸	39.097 ⁷⁸	60.90 ⁴⁵
20.5	2.641 ⁷	39.85 ²⁰²	3.338 ¹⁸	43.48 ²⁶³	60.378 ²⁵	25.58 ¹⁰⁴	39.175 ²⁶	60.45 ³²
30.4	2.634 ⁵⁴	41.87 ¹⁷⁸	3.320 ⁶⁸	46.01 ²²⁴	60.403 ³⁸	26.62 ¹⁰⁶	39.201 ²⁵	60.13 ¹⁸
Feb. 9.4	2.580 ⁹⁷	43.65 ¹⁴⁹	3.252 ¹¹³	48.25 ¹⁹²	60.365 ⁹⁴	27.67 ¹⁰¹	39.176 ⁷¹	59.95 ⁸
19.4	2.483 ¹³³	45.14 ¹¹⁸	3.139 ¹⁵¹	50.17 ¹⁵⁶	60.271 ¹⁴³	28.68 ⁸⁹	39.105 ¹¹¹	59.87 ⁰
Mar. 1.4	2.350 ¹⁶¹	46.32 ⁸⁸	2.988 ¹⁷⁹	51.73 ¹¹⁸	60.128 ¹⁸¹	29.57 ⁷³	38.994 ¹⁴⁰	59.87 ⁵
11.3	2.189 ¹⁷⁸	47.20 ⁵⁶	2.809 ¹⁹⁶	52.91 ⁷⁹	59.947 ²⁰⁷	30.30 ⁵⁴	38.854 ¹⁶²	59.92 ⁹
21.3	2.011 ¹⁸⁵	47.76 ²⁴	2.611 ²⁰⁷	53.70 ³⁹	59.740 ²¹⁸	30.84 ³¹	38.692 ¹⁷²	60.01 ¹¹
31.3	1.826 ¹⁸⁴	48.00 ⁶	2.404 ²⁰⁷	54.09 ¹	59.522 ²¹⁷	31.15 ⁹	38.520 ¹⁷¹	60.12 ¹¹
Apr. 10.2	1.642 ¹⁷¹	47.94 ³⁸	2.197 ¹⁹⁶	54.10 ³⁸	59.305 ²⁰⁸	31.24 ¹⁶	38.349 ¹⁵⁹	60.23 ¹²
20.2	1.471 ¹⁵³	47.56 ⁶⁷	2.002 ¹⁷⁷	53.72 ⁷⁵	59.102 ¹⁷⁹	31.08 ³⁸	38.190 ¹⁴¹	60.35 ¹¹
30.2	1.318 ¹²⁶	46.89 ⁹³	1.825 ¹⁵¹	52.97 ¹¹⁰	58.923 ¹⁴⁷	30.70 ⁵⁸	38.049 ¹¹³	60.46 ¹¹
May 10.2	1.192 ⁹⁶	45.96 ¹¹⁹	1.674 ¹¹⁸	51.87 ¹⁴¹	58.776 ¹⁰⁶	30.12 ⁷⁶	37.936 ⁸¹	60.57 ¹³
20.1	1.096 ⁶⁰	44.77 ¹⁴¹	1.556 ⁸³	50.46 ¹⁷³	58.670 ⁶¹	29.36 ⁹⁹	37.865 ⁴⁷	60.70 ¹³
30.1	1.036 ²³	43.36 ¹⁶¹	1.473 ⁴⁶	48.74 ¹⁹⁸	58.609 ¹³	28.46 ¹⁰²	37.808 ⁶	60.83 ¹⁴
June 9.1	1.013 ¹⁵	41.75 ¹⁷⁶	1.427 ⁶	46.79 ²¹⁵	58.596 ³⁶	27.44 ¹¹⁰	37.802 ³²	60.97 ¹⁶
19.1	1.028 ⁵¹	39.99 ¹⁸⁶	1.421 ³⁴	44.64 ²²⁹	58.632 ⁸³	26.34 ¹¹⁵	37.834 ⁶⁹	61.13 ¹⁷
29.0	1.079 ⁸⁸	38.13 ¹⁹²	1.455 ⁷⁴	42.35 ²³⁵	58.715 ¹²⁹	25.19 ¹¹⁸	37.903 ¹⁰⁶	61.30 ¹⁷
July 9.0	1.167 ¹²³	36.21 ¹⁹¹	1.529 ¹¹¹	40.00 ²³⁶	58.844 ¹⁷²	24.01 ¹¹⁶	38.009 ¹³⁹	61.47 ¹⁶
19.0	1.290 ¹⁵⁵	34.30 ¹⁸⁴	1.640 ¹⁴⁵	37.64 ²²⁹	59.016 ²¹¹	22.85 ¹¹⁵	38.148 ¹⁷¹	61.63 ¹⁴
28.9	1.445 ¹⁸³	32.46 ¹⁹⁹	1.785 ¹⁷⁸	35.35 ²¹³	59.227 ²⁴⁶	21.70 ¹¹³	38.319 ¹⁹⁹	61.77 ⁹
Aug. 7.9	1.628 ²¹⁰	30.77 ¹⁵⁰	1.963 ²⁰⁹	33.22 ¹⁹¹	59.473 ²⁷⁷	20.57 ¹⁰⁹	38.518 ²²³	61.86 ²
17.9	1.838 ²³³	29.27 ¹²³	2.172 ²³⁵	31.31 ¹⁵⁹	59.750 ³⁰⁵	19.48 ¹⁰³	38.741 ²⁴⁶	61.88 ⁸
27.9	2.071 ²⁶⁴	28.05 ⁹⁰	2.407 ²⁵⁹	29.72 ¹²²	60.055 ³²⁹	18.45 ⁹⁷	38.987 ²⁶⁶	61.80 ²⁰
Sept. 6.8	2.325 ²⁷⁰	27.15 ⁵²	2.666 ²⁷⁹	28.50 ⁷⁸	60.384 ³⁴⁹	17.48 ⁹⁰	39.253 ²⁸¹	61.60 ³²
16.8	2.595 ²⁸³	26.63 ¹¹	2.945 ²⁹⁴	27.72 ³⁰	60.733 ³⁶⁴	16.58 ⁸³	39.534 ²⁹⁵	61.28 ⁴⁶
26.8	2.878 ²⁹⁴	26.52 ³²	3.239 ³⁰⁶	27.42 ²¹	61.097 ³⁷⁷	15.75 ⁷³	39.829 ³⁰⁷	60.82 ⁶¹
Oct. 6.8	3.172 ²⁹⁹	26.84 ⁷⁷	3.545 ³¹²	27.63 ⁷³	61.474 ³⁸⁷	15.02 ⁶³	40.136 ³¹³	60.21 ⁷⁵
16.7	3.471 ²⁹⁹	27.61 ¹¹⁹	3.857 ³¹³	28.36 ¹²⁴	61.859 ³⁸⁷	14.39 ⁵¹	40.449 ³¹⁶	59.46 ⁸⁵
26.7	3.770 ²⁹⁵	28.80 ¹⁵⁸	4.170 ³⁰⁶	29.60 ¹⁷¹	62.246 ³⁸³	13.88 ³⁶	40.765 ³¹⁴	58.61 ⁹⁴
Nov. 5.7	4.065 ²⁸³	30.38 ¹⁹¹	4.476 ²⁹⁴	31.31 ²¹³	62.629 ³⁷³	13.52 ¹⁸	41.079 ³⁰⁵	57.67 ¹⁰⁰
15.6	4.348 ²⁶⁴	32.29 ²¹⁹	4.770 ²⁷⁴	33.44 ²⁴⁹	63.002 ³⁵²	13.34 ⁰	41.384 ²⁹¹	56.67 ¹⁰¹
25.6	4.612 ²³⁸	34.48 ²³⁸	5.044 ²⁴⁴	35.93 ²⁷⁴	63.354 ³²⁴	13.34 ²¹	41.675 ²⁶⁷	55.66 ⁹⁶
Dec. 5.6	4.850 ²⁰⁵	36.86 ²⁴⁹	5.288 ²⁰⁸	38.67 ²⁹¹	63.678 ²⁸⁶	13.55 ⁴¹	41.942 ²³⁸	54.68 ⁹¹
15.6	5.055 ¹⁶⁵	39.35 ²⁵²	5.496 ¹⁶⁵	41.58 ²⁹⁹	63.964 ²³⁸	13.96 ⁵⁹	42.180 ²⁰⁰	53.77 ⁸¹
25.5	5.220 ¹²⁰	41.87 ²⁴⁸	5.661 ¹¹⁷	44.57 ²⁹⁸	64.202 ¹⁸⁴	14.55 ⁷⁸	42.380 ¹⁵⁵	52.96 ⁶⁶
35.5	5.340	44.35	5.778	47.55	64.386	15.33	42.535	52.30
Mean Place	0.220	35.28	0.931	38.37	56.990	25.69	36.417	62.98
Sec δ , Tan δ	1.038	-0.277	1.115	-0.493	1.295	+0.823	1.042	+0.292
$D\psi\alpha$, $D\alpha$	+0.05	0.00	+0.05	-0.01	+0.08	+0.02	+0.08	+0.01
$D\psi\delta$, $D\delta$	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0	-0.1	+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^2 Volantis. Mag. 3.9			λ Geminorum. Mag. 3.6			π Argus. Mag. 2.7			δ Geminorum. Mag. 3.5		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 7 9	° ' " -70 21		h m 7 13	° ' " +16 41		h m 7 14	° ' " -36 56		h m 7 15	° ' " +22 7	
Jan. 0.5	30.97	48.87		22.027	26.06		15.015	51.65		12.738	68.23	
10.5	30.96	52.69	382	22.161	25.47	58	15.102	54.99	334	12.878	67.99	24
20.5	30.83	56.40	371	22.243	25.03	44	15.130	58.19	320	12.966	67.89	10
30.4	30.56	59.89	349	22.273	24.73	30	15.100	61.16	297	13.000	67.92	3
Feb. 9.4	30.19	63.08	319	22.252	24.57	16	15.016	63.84	268	12.981	68.05	13
		283			6		134	234		68		21
19.4	29.72	65.91		22.184	24.51		14.882	66.18		12.913	68.26	
Mar. 1.4	29.17	68.30	289	22.076	24.53	2	14.706	68.11	193	12.803	68.52	26
11.3	28.55	70.21	191	21.937	24.60	7	14.498	69.62	151	12.661	68.78	26
21.3	27.89	71.60	139	21.776	24.71	11	14.268	70.69	107	12.495	69.01	23
31.3	27.20	72.47	87	21.605	24.84	13	14.026	71.30	61	12.319	69.21	20
		33		171	12		243	15		176		15
Apr. 10.3	26.51	72.80		21.434	24.96		13.783	71.45		12.143	69.36	
20.2	25.84	72.61	19	21.274	25.08	12	13.549	71.16	29	11.977	69.44	8
30.2	25.20	71.90	71	21.131	25.20	12	13.335	70.43	73	11.829	69.47	3
May 10.2	24.60	70.68	122	21.015	25.31	11	13.145	69.28	113	11.708	69.43	4
20.1	24.07	68.99	169	20.932	25.42	11	12.988	67.76	152	11.619	69.35	8
		212		49	12		120	186		51		11
30.1	23.61	66.87		20.883	25.54		12.868	65.90		11.568	69.24	
June 9.1	23.24	64.39	248	20.872	25.66	12	12.789	63.72	213	11.556	69.10	14
19.1	22.97	61.61	278	20.899	25.79	13	12.752	61.31	241	11.583	68.94	16
29.0	22.81	58.58	303	20.964	25.94	15	12.758	58.71	260	11.649	68.77	17
July 9.0	22.75	55.43	315	21.066	26.07	13	12.808	56.02	269	11.753	68.58	19
		321		134	13		92	272		138		20
19.0	22.78	52.22		21.200	26.20		12.900	53.30		11.891	68.38	
29.0	22.94	49.04	318	21.367	26.30	10	13.034	50.65	265	12.062	68.15	23
Aug. 7.9	23.21	46.03	301	21.561	26.35	5	13.206	48.15	250	12.263	67.89	26
17.9	23.57	43.26	277	21.782	26.32	3	13.415	45.88	227	12.489	67.58	31
27.9	24.02	40.84	242	22.024	26.20	12	13.655	43.94	194	12.740	67.22	36
		198		263	24		271	153		270		44
Sept. 6.8	24.55	38.86		22.287	25.96		13.926	42.41		13.010	66.78	
16.8	25.15	37.42	144	22.566	25.60	36	14.222	41.35	106	13.299	66.25	53
26.8	25.80	36.56	86	22.860	25.10	50	14.587	40.83	52	13.603	65.63	62
Oct. 6.8	26.48	36.33	23	23.167	24.47	63	14.867	40.88	5	13.919	64.92	71
16.7	27.18	36.78	45	23.480	23.69	78	15.205	41.50	62	14.243	64.15	77
		111		317	88		340	120		328		83
26.7	27.86	37.89		23.797	22.81		15.545	42.70		14.571	63.32	
Nov. 5.7	28.51	39.63	174	24.114	21.85	96	15.879	44.45	175	14.899	62.47	85
15.7	29.11	41.97	234	24.422	20.84	101	16.198	46.69	224	15.219	61.62	85
25.6	29.63	44.82	285	24.717	19.82	102	16.493	49.36	267	15.524	60.81	81
Dec. 5.6	30.06	48.07	325	24.989	18.83	99	16.755	52.36	300	15.808	60.09	72
		358		242	91		222	322		252		62
15.6	30.37	51.65		25.231	17.92		16.977	55.58		16.060	59.47	
25.5	30.57	55.41	376	25.436	17.11	81	17.151	58.94	336	16.274	58.98	49
35.5	30.64	59.24	383	25.596	16.45	66	17.272	62.31	337	16.443	58.64	34
Mean Place	27.280	51.69		19.471	27.81		12.680	52.95		10.085	70.35	
Sec δ , Tan δ	2.976	-2.803		1.044	+0.300		1.251	-0.752		1.080	+0.407	
$D\psi\alpha$, $D_\omega\alpha$	-0.01	-0.06		+0.07	+0.01		+0.04	-0.02		+0.07	+0.01	
$D\psi\delta$, $D_\omega\delta$	-0.1	+1.0		-0.1	+0.9		-0.1	+0.9		-0.1	+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Volantis. Mag. 4.0		ϵ Geminorum. Mag. 3.9		γ Canis Majoris. Mag. 2.4		Groombridge 1308. Mag. 5.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 16	° ' " -67 48	h m 7 20	° ' " +27 57	h m 7 20	° ' " -29 8	h m 7 22	° ' " +68 37
Jan. 0.5	56.36	16.25	37.215	48.05	51.045	24.72	21.40	68.95
10.5	56.38	20.09	37.367	48.15	51.148	27.78	21.68	71.32
20.5	56.29	23.84	37.465	48.41	51.196	30.73	21.82	73.80
30.4	56.09	27.39	37.504	48.78	51.190	33.46	21.83	76.29
Feb. 9.4	55.79	30.66	37.489	49.24	51.132	35.91	21.73	78.69
19.4	55.40	33.56	37.422	49.74	51.027	38.03	21.50	80.89
Mar. 1.4	54.92	36.03	37.311	50.25	50.883	39.79	21.18	82.82
11.3	54.39	38.03	37.165	50.72	50.705	41.17	20.77	84.38
21.3	53.82	39.53	36.993	51.12	50.506	42.15	20.30	85.52
31.3	53.22	40.51	36.809	51.42	50.295	42.71	19.79	86.18
Apr. 10.3	52.62	40.94	36.623	51.59	50.084	42.88	19.28	86.35
20.2	52.03	40.84	36.446	51.65	49.879	42.62	18.79	86.03
30.2	51.46	40.22	36.289	51.59	49.690	41.98	18.33	85.23
May 10.2	50.94	39.09	36.159	51.42	49.526	40.96	17.92	84.00
20.1	50.48	37.48	36.061	51.13	49.390	39.62	17.59	82.37
30.1	50.07	35.44	36.002	50.77	49.290	37.95	17.34	80.40
June 9.1	49.74	33.01	35.983	50.35	49.226	36.02	17.19	78.17
19.1	49.50	30.28	36.004	49.87	49.202	33.86	17.13	75.72
29.0	49.35	27.30	36.067	49.36	49.217	31.56	17.19	73.13
July 9.0	49.29	24.17	36.169	48.82	49.271	29.14	17.33	70.47
19.0	49.33	20.97	36.308	48.26	49.363	26.70	17.57	67.79
29.0	49.46	17.79	36.481	47.67	49.493	24.32	17.90	65.16
Aug. 7.9	49.69	14.76	36.686	47.07	49.657	22.09	18.32	62.63
17.9	50.00	11.95	36.917	46.44	49.853	20.07	18.81	60.24
27.9	50.40	9.49	37.175	45.78	50.079	18.34	19.37	58.05
Sept. 6.8	50.88	7.47	37.455	45.08	50.331	16.99	19.98	56.09
16.8	51.41	5.96	37.754	44.33	50.605	16.07	20.65	54.40
26.8	51.99	5.04	38.069	43.56	50.900	15.63	21.36	53.00
Oct. 6.8	52.60	4.74	38.398	42.76	51.210	15.72	22.10	51.94
16.7	53.23	5.11	38.736	41.95	51.528	16.35	22.85	51.25
26.7	53.85	6.16	39.080	41.14	51.849	17.50	23.61	50.95
Nov. 5.7	54.45	7.83	39.424	40.37	52.166	19.16	24.37	51.04
15.7	55.00	10.11	39.761	39.67	52.473	21.28	25.10	51.56
25.6	55.48	12.91	40.083	39.06	52.761	23.78	25.79	52.48
Dec. 5.6	55.90	16.14	40.382	38.57	53.021	26.57	26.42	53.80
15.6	56.21	19.70	40.650	38.24	53.245	29.58	26.97	55.49
25.5	56.43	23.46	40.879	38.08	53.427	32.69	27.42	57.50
35.5	56.53	27.30	41.060	38.08	53.560	35.81	27.76	59.74
Mean Place	52.958	19.34	34.438	50.80	48.770	25.61	15.511	72.89
Sec δ , Tan δ	2.647	-2.451	1.132	+0.531	1.145	-0.558	2.745	+2.556
$D\psi\alpha$, $D_\alpha\alpha$	0.00	-0.05	+0.07	+0.01	+0.05	-0.01	+0.13	+0.06
$D\psi\delta$, $D_\alpha\delta$	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Canis Minoris. Mag. 3.1		ρ Geminorum. Mag. 4.2		σ Argus. Mag. 3.3		α^2 Geminorum. (Castor.) Mag. 2.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 22	° ' " + 8 27	h m 7 23	° ' " +31 56	h m 7 26	° ' " -43 7	h m 7 29	° ' " +32 4
	s	"	s	"	s	"	s	"
Jan. 0.5	41.479 ¹³⁶	25.14	49.393 ¹⁶²	59.75	38.187 ⁹⁶	56.08	21.275 ¹⁶⁸	15.47
10.5	41.615 ⁸⁵	24.02 ¹¹²	49.555 ¹⁰⁴	60.10 ³⁵	38.283 ³³	59.62 ³⁵⁴	21.443 ¹¹⁰	15.80
20.5	41.700 ³⁵	23.05 ⁸⁰	49.659 ⁴⁴	60.60 ⁶¹	38.316 ²⁹	63.05 ³⁴³	21.553 ⁴⁹	16.28
30.5	41.735 ¹⁵	22.25 ⁶³	49.703 ¹²	61.21 ⁷⁰	38.287 ⁹⁰	66.29 ²⁹⁴	21.602 ⁸	16.89
Feb. 9.4	41.720 ⁶¹	21.62 ⁴⁷	49.691 ⁶⁷	61.91 ⁷²	38.197 ¹⁴⁵	69.23 ²⁶⁰	21.594 ⁶²	17.60
19.4	41.659 ⁹⁹	21.15 ³³	49.624 ¹¹⁴	62.63 ⁶⁸	38.052 ¹⁸⁹	71.83 ²²⁰	21.532 ¹¹⁰	18.33
Mar. 1.4	41.560 ¹³²	20.82 ¹⁸	49.510 ¹⁵⁰	63.31 ⁶²	37.863 ²²⁸	74.03 ¹⁷⁶	21.422 ¹⁴⁷	19.03
11.3	41.428 ¹⁵³	20.64 ⁸	49.360 ¹⁷⁸	63.93 ⁵³	37.635 ²⁵⁴	75.79 ¹³⁰	21.275 ¹⁷⁶	19.67
21.3	41.275 ¹⁶⁵	20.56 ³	49.182 ¹⁹¹	64.45 ³⁷	37.381 ²⁶⁸	77.09 ⁸⁸	21.099 ¹⁹⁰	20.21
31.3	41.110 ¹⁶⁵	20.59 ¹¹	48.991 ¹⁹⁴	64.82 ²¹	37.113 ³⁷¹	77.92 ³⁴	20.909 ¹⁹⁵	20.62
Apr. 10.3	40.945 ¹⁵⁸	20.70 ¹⁸	48.797 ¹⁸⁵	65.03 ⁶	36.842 ²⁶⁵	78.26 ¹⁴	20.714 ¹⁸⁷	20.86
20.2	40.787 ¹⁴²	20.88 ²⁷	48.612 ¹⁶⁵	65.09 ¹⁰	36.577 ²⁴⁸	78.12 ⁶¹	20.527 ¹⁶⁹	20.95
30.2	40.645 ¹¹⁷	21.15 ³³	48.447 ¹³⁹	64.99 ²⁷	36.329 ²²⁴	77.51 ¹⁰⁶	20.358 ¹⁴²	20.87
May 10.2	40.528 ⁸⁹	21.48 ⁴⁰	48.308 ¹⁰⁴	64.72 ⁴⁰	36.105 ¹⁹⁸	76.45 ¹⁴⁸	20.216 ¹⁰⁸	20.62
20.2	40.439 ⁵⁵	21.88 ⁴⁵	48.204 ⁶⁵	64.32 ⁵¹	35.912 ¹⁵⁵	74.97 ¹⁸⁵	20.108 ⁷¹	20.24
30.1	40.384 ¹⁹	22.33 ⁵¹	48.139 ²⁴	63.81 ⁶⁰	35.757 ¹¹³	73.12 ²¹⁸	20.037 ²⁹	19.74
June 9.1	40.365 ¹⁶	22.84 ⁵⁵	48.115 ¹⁹	63.21 ⁶⁹	35.644 ⁶⁸	70.94 ²⁴⁸	20.008 ¹²	19.13
19.1	40.381 ⁵¹	23.39 ⁵⁹	48.134 ⁶¹	62.52 ⁷³	35.576 ²¹	68.46 ²⁶⁸	20.020 ⁵⁵	18.43
29.0	40.432 ⁸⁷	23.98 ⁵⁹	48.195 ¹⁰¹	61.79 ⁷⁷	35.555 ²⁵	65.78 ²⁸¹	20.075 ⁹⁴	17.68
July 9.0	40.519 ¹²⁰	24.57 ⁵⁸	48.296 ¹⁴⁰	61.02 ⁸⁰	35.580 ⁷¹	62.97 ²⁶⁶	20.169 ¹³⁴	16.88
19.0	40.639 ¹⁴⁹	25.15 ⁵³	48.436 ¹⁷⁷	60.22 ⁸²	35.651 ¹¹⁸	60.11 ²⁸⁸	20.303 ¹⁷⁰	16.05
29.0	40.788 ¹⁷⁸	25.68 ⁴⁶	48.613 ²⁰⁹	59.40 ⁸³	35.769 ¹⁶²	57.28 ²⁷⁰	20.473 ²⁰³	15.20
Aug. 7.9	40.966 ²⁰³	26.14 ³⁶	48.822 ²³⁸	58.57 ⁸⁵	35.931 ²⁰⁸	54.58 ²⁴⁶	20.676 ²³²	14.32
17.9	41.169 ²²⁶	26.50 ²⁰	49.060 ²⁶⁶	57.72 ⁸⁶	36.134 ²⁴²	52.12 ²¹⁶	20.908 ²⁶⁰	13.43
27.9	41.395 ²⁴⁶	26.70 ⁴	49.326 ²⁸⁸	56.87 ⁸⁶	36.376 ²⁷⁶	49.96 ¹⁷⁵	21.168 ²⁸³	12.53
Sept. 6.9	41.641 ²⁶⁵	26.74 ¹⁶	49.614 ³⁰⁹	56.01 ⁸⁷	36.652 ³⁰⁷	48.21 ¹²⁷	21.451 ³⁰⁶	11.61
16.8	41.906 ²⁸⁰	26.58 ³⁷	49.923 ³²⁶	55.14 ⁸⁷	36.959 ³³¹	46.94 ⁷³	21.757 ³²³	10.68
26.8	42.186 ²⁹³	26.21 ⁵⁹	50.249 ³⁴¹	54.27 ⁸⁶	37.290 ³⁵¹	46.21 ¹⁵	22.080 ³³⁹	9.76
Oct. 6.8	42.479 ³⁰³	25.62 ⁸¹	50.590 ³⁵²	53.41 ⁸⁴	37.641 ³⁶²	46.06 ⁴⁸	22.419 ³⁵¹	8.84
16.7	42.782 ³⁰⁷	24.81 ¹⁰⁰	50.942 ³⁵⁸	52.57 ⁷⁸	38.003 ³⁶⁶	46.54 ¹⁰⁸	22.770 ³⁵⁷	7.94
26.7	43.089 ³⁰⁷	23.81 ¹¹⁸	51.300 ³⁵⁷	51.79 ⁷⁰	38.369 ³⁶¹	47.62 ¹⁶⁶	23.127 ³⁵⁹	7.10
Nov. 5.7	43.396 ³⁰¹	22.63 ¹³⁰	51.657 ³⁵⁰	51.09 ⁶⁰	38.730 ³⁴⁵	49.28 ²²¹	23.486 ³⁵²	6.34
15.7	43.697 ²⁸⁹	21.33 ¹³⁹	52.007 ³³⁷	50.49 ⁴⁷	39.075 ³²²	51.49 ²⁶⁸	23.838 ³³⁹	5.69
25.6	43.986 ²⁶⁷	19.94 ¹⁴²	52.344 ³¹³	50.02 ³⁰	39.397 ²⁸⁶	54.17 ³⁰⁵	24.177 ³¹⁷	5.17
Dec. 5.6	44.253 ²⁴⁰	18.52 ¹³⁹	52.657 ²⁸²	49.72 ¹³	39.683 ²⁴²	57.22 ³³³	24.494 ²⁸⁶	4.81
15.6	44.493 ²⁰⁴	17.13 ¹³²	52.939 ²⁴⁰	49.59 ⁵	39.925 ¹⁹⁰	60.55 ³⁵¹	24.780 ²⁴⁵	4.65
25.6	44.697 ¹⁶¹	15.81 ¹²¹	53.179 ¹⁹⁰	49.64 ²⁵	40.115 ¹³³	64.06 ³⁵⁶	25.025 ¹⁹⁶	4.68
35.5	44.858	14.60	53.369	49.89	40.248	67.62	25.221	4.90
Mean Place	39.049	26.92	46.515	62.93	35.800	58.09	18.402	19.07
Sec δ , Tan δ	1.011	+0.149	1.178	+0.624	1.370	-0.937	1.180	+0.627
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.07	0.00	+0.08	+0.01	+0.05	-0.02	+0.08	+0.02
$D_{\psi} \delta$, $D_{\omega} \delta$	-0.1	+0.9	-0.1	+0.9	-0.1	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	25 Monocerotis. Mag. 5.2		α Canis Minoris. (Procyon.) Mag. 0.5		24 Lyncis. Mag. 5.0		κ Geminorum. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 33	° ' " - 3 55	h m 7 34	° ' " + 5 26	h m 7 35	° ' " + 58 54	h m 7 39	° ' " + 24 35
	s	"	s	"	s	"	s	"
Jan. 0.5	11.366 ¹³⁶	30.15	59.798 ¹³⁹	16.26	63.927 ²⁴³	16.18	29.046 ¹⁶⁸	48.84 ¹⁷
10.5	11.502 ⁸⁶	32.04 ¹⁸⁹	59.937 ⁹¹	14.90 ¹³⁶	64.170 ¹⁵²	18.02 ¹⁸⁴	29.214 ¹¹⁵	48.67 ¹
20.5	11.588 ³⁶	33.77 ¹⁷³	60.028 ⁴⁰	13.70 ¹²⁰	64.322 ⁵⁹	20.02 ²⁰⁰	29.329 ⁶⁰	48.66 ¹⁵
30.5	11.624 ¹³	35.31 ¹⁵⁴	60.068 ¹⁰	12.68 ¹⁰²	64.381 ³³	22.10 ²⁰⁸	29.389 ⁴	48.81 ²⁹
Feb. 9.4	11.611 ⁵⁸	36.65 ¹³⁴	60.058 ⁵⁶	11.84 ⁸⁴	64.348 ¹¹⁹	24.16 ¹⁹⁶	29.393 ⁴⁸	49.10 ³⁷
19.4	11.553 ⁹⁷	37.75 ⁸⁸	60.002 ⁹⁵	11.20 ⁴⁷	64.229 ¹⁹⁸	26.12 ¹⁷⁵	29.345 ⁹³	49.47 ⁴¹
Mar. 1.4	11.456 ¹³⁰	38.63 ⁶³	59.907 ¹²⁸	10.73 ³¹	64.031 ²⁶⁰	27.87 ¹⁴⁹	29.252 ¹³⁰	49.88 ⁴²
11.4	11.326 ¹⁵¹	39.26 ⁴²	59.729 ¹⁸⁰	10.42 ¹⁵	63.771 ³⁰⁶	29.36 ¹¹⁵	29.122 ¹⁵⁸	50.30 ⁴⁰
21.3	11.175 ¹⁶⁵	39.68 ¹⁹	59.629 ¹⁶⁴	10.27 ³	63.465 ³³⁴	30.51 ⁷⁷	28.964 ¹⁷³	50.70 ³⁵
31.3	11.010 ¹⁶⁹	39.87 ⁰	59.465 ¹⁶⁵	10.24 ⁹	63.131 ³⁴⁵	31.28 ⁸⁵	28.791 ¹⁷⁷	51.05 ²⁵
Apr. 10.3	10.841 ¹⁶⁰	39.87 ²¹	59.300 ¹⁵⁹	10.33 ²⁰	62.786 ³³⁸	31.63 ⁶	28.614 ¹⁷³	51.30 ¹⁸
20.2	10.681 ¹⁴⁷	39.66 ³⁹	59.141 ¹⁴⁵	10.53 ²⁹	62.448 ³¹³	31.57 ⁴⁷	28.441 ¹⁵⁶	51.48 ⁹
30.2	10.534 ¹²⁵	39.27 ⁵⁷	58.996 ¹²¹	10.82 ³⁷	62.135 ²⁷⁵	31.10 ⁸⁶	28.285 ¹³⁴	51.57 ¹
May 10.2	10.409 ⁹⁹	38.70 ⁷⁵	58.875 ⁹⁴	11.19 ⁴⁶	61.860 ²²⁶	30.24 ¹²³	28.151 ¹⁰⁴	51.56 ¹⁰
20.2	10.310 ⁶⁷	37.95 ⁸⁹	58.781 ⁸²	11.65 ⁵⁴	61.634 ¹⁶⁷	29.02 ¹⁵³	28.047 ⁷⁰	51.46 ¹⁷
30.1	10.243 ³⁵	37.06 ¹⁰²	58.719 ²⁸	12.19 ⁶¹	61.467 ¹⁰³	27.49 ¹⁷⁸	27.977 ³³	51.29 ²⁵
June 9.1	10.208 ¹	36.04 ¹¹²	58.691 ⁶	12.80 ⁶⁶	61.364 ³⁵	25.71 ¹⁹⁹	27.944 ⁵	51.04 ²⁹
19.1	10.207 ³⁵	34.92 ¹²¹	58.697 ⁴²	13.46 ⁶⁹	61.329 ⁸⁴	23.72 ²¹⁵	27.949 ⁴³	50.75 ³⁴
29.1	10.242 ⁶⁸	33.71 ¹²⁴	58.739 ⁷⁶	14.15 ⁷⁰	61.363 ¹⁰³	21.57 ²²⁴	27.992 ⁸¹	50.41 ³⁷
July 9.0	10.310 ¹⁰⁰	32.47 ¹²⁴	58.815 ¹⁰⁹	14.85 ⁶⁸	61.466 ¹⁶⁸	19.33 ²²⁹	28.073 ¹¹⁶	50.04 ⁴²
19.0	10.410 ¹²¹	31.23 ¹¹⁹	58.924 ¹³⁷	15.53 ⁶³	61.634 ²⁶¹	17.04 ²²⁹	28.189 ¹⁴⁹	49.62 ⁴⁶
29.0	10.541 ¹⁶⁰	30.04 ¹⁰⁹	59.061 ¹⁶⁷	16.16 ⁵⁵	61.865 ²⁶⁸	14.75 ²²⁵	28.338 ¹⁸⁰	49.16 ⁵¹
Aug. 7.9	10.701 ¹⁸⁵	28.95 ⁹⁵	59.228 ¹⁹²	16.71 ⁴³	62.153 ³⁴¹	12.50 ²¹⁶	28.518 ²⁰⁹	48.65 ⁵⁶
17.9	10.886 ²¹⁰	28.00 ⁷⁴	59.420 ²¹⁶	17.14 ²⁷	62.494 ³⁹⁰	10.34 ²⁰⁴	28.727 ²³⁴	48.09 ⁶²
27.9	11.096 ²³²	27.26 ⁵¹	59.636 ²³⁷	17.41 ⁸	62.884 ⁴³³	8.30 ¹⁸⁹	28.961 ²⁵⁹	47.47 ⁷⁰
Sept. 6.9	11.328 ²⁶³	26.75 ²¹	59.873 ²⁵⁷	17.49 ¹⁴	63.317 ⁴⁶⁹	6.41 ¹⁶⁹	29.220 ²⁷⁹	46.77 ⁷⁷
16.8	11.581 ²⁶⁹	26.54 ¹⁰	60.130 ²⁷²	17.35 ³⁸	63.786 ⁵⁰¹	4.72 ¹⁴⁷	29.499 ²⁹⁹	46.00 ⁸⁴
26.8	11.850 ²⁸³	26.64 ⁴²	60.402 ²⁸⁷	16.97 ⁶³	64.287 ⁵²⁶	3.25 ¹²²	29.798 ³¹⁴	45.16 ⁹⁰
Oct. 6.8	12.133 ²⁹⁴	27.06 ⁷⁷	60.689 ²⁹⁷	16.34 ⁸⁶	64.813 ⁵⁴⁶	2.03 ⁹⁵	30.112 ³²⁶	44.26 ⁹⁶
16.8	12.427 ³⁰⁰	27.83 ¹⁰⁹	60.986 ³⁰⁵	15.48 ¹¹¹	65.359 ⁵⁵⁵	1.08 ⁶³	30.438 ³³⁵	43.30 ⁹⁹
26.7	12.727 ³⁰⁸	28.92 ¹³⁸	61.291 ³⁰⁴	14.37 ¹³⁰	65.914 ⁵⁵⁵	0.45 ²⁹	30.773 ³³⁹	42.31 ¹⁰⁰
Nov. 5.7	13.030 ²⁹⁷	30.30 ¹⁶⁴	61.595 ³⁰⁰	13.07 ¹⁴⁶	66.469 ⁵⁴³	0.16 ⁴	31.112 ³³⁵	41.31 ⁹⁵
15.7	13.327 ²⁸⁶	31.94 ¹⁸³	61.895 ²⁸⁹	11.61 ¹⁵⁷	67.012 ⁵²¹	0.20 ⁴²	31.447 ³²⁴	40.36 ⁸⁸
25.6	13.613 ²⁶⁶	33.77 ¹⁹⁶	62.184 ²⁶⁹	10.04 ¹⁶²	67.533 ⁴⁸³	0.62 ⁷⁸	31.771 ³⁰⁵	39.48 ⁷⁸
Dec. 5.6	13.879 ²³⁹	35.73 ²⁰³	62.453 ²⁴³	8.42 ¹⁶¹	68.016 ⁴³²	1.40 ¹¹³	32.076 ²⁷⁷	38.70 ⁶²
15.6	14.118 ²⁰²	37.76 ²⁰²	62.696 ²⁰⁷	6.81 ¹⁵⁶	68.448 ³⁶⁷	2.53 ¹⁴⁴	32.353 ²⁴⁰	38.08 ⁴⁷
25.6	14.320 ¹⁶¹	39.78 ¹⁹⁶	62.903 ¹⁶⁵	5.25 ¹⁴⁵	68.815 ²⁹¹	3.97 ¹⁷²	32.593 ¹⁹⁶	37.61 ²⁸
35.5	14.481	41.74	63.068	3.80	69.106	5.69	32.789	37.33
Mean Place	9.064	28.96	57.476	18.37	59.573	21.49	26.375	52.70
Sec δ , Tan δ	1.002	-0.069	1.005	+0.095	1.936	+1.658	1.100	+0.458
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.06	0.00	+0.10	+0.04	+0.07	+0.01
$D\psi\delta$, $D\omega\delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Geminorum. (Pollux.) Mag. 1.2		ϵ Puppis. Mag. 5.1		ξ Argus. Mag. 3.5		ϕ Geminorum. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 40	° ' " +28 13	h m 7 42	° ' " -14 21	h m 7 45	° ' " -24 38	h m 7 48	° ' " +28 58
Jan. 0.5	17.122 ¹⁷²	35.45	9.801 ¹³⁶	40.95	50.435 ¹³⁵	61.87	27.940 ¹⁸¹	49.50 ⁷
10.5	17.294 ¹¹⁸	35.49 ⁴	9.937 ⁸⁷	43.42 ²⁴⁷	50.570 ⁸²	64.82 ²⁹⁵	28.121 ¹²⁷	49.43 ¹²
20.5	17.412 ⁶¹	35.73 ²⁴	10.024 ³⁷	45.76 ²³⁴	50.652 ²⁸	67.66 ²⁸⁴	28.248 ⁷⁰	49.55 ²⁹
30.5	17.473 ⁴	36.10 ⁴⁸	10.061 ¹⁴	47.89 ¹⁹¹	50.680 ²⁴	70.31 ²⁴¹	28.318 ¹³	49.84 ⁴¹
Feb. 9.4	17.477 ⁵⁰	36.58 ⁵⁶	10.047 ⁶¹	49.80 ¹⁶³	50.656 ⁷²	72.72 ²¹⁰	28.331 ⁴⁰	50.25 ⁵⁰
19.4	17.427 ⁹⁸	37.14 ⁵⁸	9.986 ¹⁰⁰	51.43 ¹³⁶	50.584 ¹¹⁴	74.82 ¹⁷⁸	28.291 ⁸⁷	50.75 ⁵⁵
Mar. 1.4	17.329 ¹³⁵	37.72 ⁵⁶	9.886 ¹³⁴	52.79 ¹⁰⁴	50.470 ¹⁴⁸	76.60 ¹⁴³	28.204 ¹²⁶	51.30 ⁵⁵
11.4	17.194 ¹⁶⁴	38.28 ⁵⁰	9.752 ¹⁵⁸	53.83 ⁷⁴	50.322 ¹⁷⁴	78.03 ¹⁰⁵	28.078 ¹⁵⁶	51.85 ⁵¹
21.3	17.030 ¹⁸⁰	38.78 ⁴²	9.594 ¹⁷¹	54.57 ⁴⁵	50.148 ¹⁸⁹	79.08 ⁶⁸	27.922 ¹⁷⁴	52.36 ⁴³
31.3	16.850 ¹⁸⁵	39.20 ²⁹	9.423 ¹⁷⁶	55.02 ¹⁴	49.959 ¹⁹⁵	79.76 ⁸¹	27.748 ¹⁸⁰	52.79 ³⁴
Apr. 10.3	16.665 ¹⁸⁰	39.49 ¹⁶	9.247 ¹⁷²	55.16 ¹⁵	49.764 ¹⁹¹	80.07 ⁷	27.568 ¹⁷⁶	53.13 ²¹
20.2	16.485 ¹⁶⁴	39.65 ⁴	9.075 ¹⁵⁸	55.01 ⁴²	49.573 ¹⁷⁹	80.00 ⁴²	27.392 ¹⁶²	53.34 ¹⁰
30.2	16.321 ¹⁴¹	39.69 ⁹	8.917 ¹⁴⁰	54.59 ⁷⁰	49.394 ¹⁵⁹	79.58 ⁷⁷	27.230 ¹⁴¹	53.44 ²
May 10.2	16.180 ¹¹⁰	39.60 ²¹	8.777 ¹¹³	53.89 ⁹⁴	49.235 ¹³⁵	78.81 ¹¹⁰	27.089 ¹¹²	53.42 ¹⁴
20.2	16.070 ⁷⁵	39.39 ³²	8.664 ⁸⁴	52.95 ¹¹⁸	49.100 ¹⁰⁴	77.71 ¹³⁸	26.977 ⁷⁸	53.28 ²⁴
30.1	15.995 ³⁷	39.07 ⁴⁰	8.580 ⁵³	51.77 ¹³⁶	48.996 ⁷²	76.33 ¹⁶⁶	26.899 ⁴³	53.04 ³³
June 9.1	15.958 ¹	38.67 ⁴⁷	8.527 ¹⁷	50.41 ¹⁵²	48.924 ³⁴	74.67 ¹⁸⁷	26.856 ⁴	52.71 ⁴¹
19.1	15.959 ⁴²	38.20 ⁵⁴	8.510 ¹⁷	48.89 ¹⁶⁶	48.888 ¹	72.80 ²⁰³	26.852 ³⁵	52.30 ⁴⁶
29.1	16.001 ⁸¹	37.66 ⁵⁹	8.527 ⁵⁰	47.23 ¹⁷²	48.887 ³⁶	70.77 ²¹⁵	26.887 ⁷³	51.84 ⁵³
July 9.0	16.082 ¹¹⁷	37.07 ⁶⁴	8.577 ⁸⁵	45.51 ¹⁷⁵	48.923 ⁷²	68.62 ²¹⁹	26.960 ¹⁰⁹	51.31 ⁵⁸
19.0	16.199 ¹⁵²	36.43 ⁶⁷	8.662 ¹¹⁷	43.76 ¹⁷⁰	48.995 ¹⁰⁷	66.43 ²¹⁶	27.069 ¹⁴²	50.73 ⁶⁴
29.0	16.351 ¹⁸³	35.76 ⁷⁸	8.779 ¹⁴⁶	42.06 ¹⁵⁹	49.102 ¹⁴⁰	64.27 ²⁰⁵	27.211 ¹⁷⁵	50.09 ⁶⁹
Aug. 7.9	16.534 ²¹³	35.03 ⁷⁵	8.925 ¹⁷⁶	40.47 ¹⁴³	49.242 ¹⁷²	62.22 ¹⁸⁸	27.386 ²⁰⁴	49.40 ⁷³
17.9	16.747 ²⁴⁰	34.28 ⁸⁰	9.101 ²⁰²	39.04 ¹²⁰	49.414 ²⁰²	60.34 ¹⁶²	27.590 ²³¹	48.67 ⁷⁹
27.9	16.987 ²⁶⁵	33.48 ⁸²	9.303 ²²⁶	37.84 ⁹²	49.616 ²²⁸	58.72 ¹²⁹	27.821 ²⁵⁷	47.88 ⁸⁴
Sept. 6.9	17.252 ²⁸⁵	32.63 ⁸⁹	9.529 ²⁴⁹	36.92 ⁵⁶	49.844 ²⁵⁵	57.43 ⁹⁰	28.078 ²⁷⁸	47.04 ⁹¹
16.8	17.537 ³⁰⁶	31.74 ⁹³	9.778 ²⁶⁸	36.36 ¹⁸	50.099 ²⁷⁵	56.53 ⁴⁶	28.356 ³⁰⁰	46.13 ⁹⁶
26.8	17.843 ³²²	30.81 ⁹⁶	10.046 ²⁸⁴	36.18 ²⁴	50.374 ²⁹⁴	56.07 ³	28.656 ³¹⁶	45.17 ¹⁰¹
Oct. 6.8	18.165 ³³⁵	29.85 ⁹⁸	10.330 ²⁹⁶	36.42 ⁶⁷	50.668 ³⁰⁹	56.10 ⁵³	28.972 ³³¹	44.16 ¹⁰⁴
16.8	18.500 ³⁴³	28.87 ⁹⁷	10.626 ³⁰⁵	37.09 ¹⁰⁸	50.977 ³¹⁸	56.63 ¹⁰⁴	29.303 ³⁴⁰	43.12 ¹⁰⁴
26.7	18.843 ³⁴⁷	27.90 ⁹⁴	10.931 ³⁰⁷	38.17 ¹⁴⁸	51.293 ³¹⁸	57.67 ¹⁵¹	29.643 ³⁴⁵	42.08 ¹⁰²
Nov. 5.7	19.190 ³⁴⁴	26.96 ⁸⁶	11.238 ³⁰¹	39.65 ¹⁸²	51.611 ³¹³	59.18 ¹⁹⁵	29.988 ³⁴⁴	41.06 ⁹⁶
15.7	19.534 ³³³	26.10 ⁷⁵	11.539 ²⁹⁰	41.47 ²¹²	51.924 ²¹²	61.13 ²³²	30.332 ³³⁴	40.10 ⁸⁷
25.6	19.867 ³¹³	25.35 ⁶¹	11.829 ²⁷⁰	43.59 ²³⁴	52.223 ²⁷⁷	63.45 ²⁶³	30.666 ³¹⁶	39.23 ⁷²
Dec. 5.6	20.180 ²⁸⁴	24.74 ⁴⁵	12.099 ²⁴²	45.93 ²⁴⁸	52.500 ²⁴⁶	66.08 ²⁸³	30.982 ²⁸⁹	38.51 ⁵⁷
15.6	20.464 ²⁴⁶	24.29 ²⁶	12.341 ²⁰⁵	48.41 ²⁵³	52.746 ²⁰⁸	68.91 ²⁹⁵	31.271 ²⁵²	37.94 ³⁸
25.6	20.710 ²⁰¹	24.03 ⁷	12.546 ¹⁶³	50.94 ²⁵³	52.954 ¹⁶²	71.86 ²⁹⁷	31.523 ²⁰⁸	37.56 ¹⁸
35.5	20.911	23.96	12.709	53.47	53.116	74.83	31.731	37.38
Mean Place	14.369	39.63	7.563	40.59	48.212	62.57	25.235	54.15
Sec δ , Tan δ	1.135	+0.537	1.032	-0.256	1.100	-0.459	1.122	+0.509
$D\psi\alpha$, $D\omega\alpha$	+0.07	+0.02	+0.05	-0.01	+0.05	-0.01	+0.07	+0.02
$D\psi\delta$, $D\omega\delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	26 Lyncis. Mag. 5.7			Groombridge 1374. Mag. 5.6			χ Argus. Mag. 3.6			ω Cancri. Mag. 5.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	7 48		+47 46	7 50		+74 8	7 54		-52 45	7 55		+25 36
Jan. 0.6	43.993	222	45.24	24.70	22.37	42.658	30.19	57.334	70.40	18		
10.5	44.215	151	46.43	25.13	24.83	42.789	33.98	57.520	70.22	133		
20.5	44.366	79	47.81	25.39	27.47	42.846	37.72	57.653	70.23	1		
30.5	44.445	5	49.30	25.47	30.19	42.829	41.32	57.730	70.43	20		
Feb. 9.4	44.450	63	50.87	25.39	32.88	42.739	44.70	57.751	70.76	33		
19.4	44.387	126	52.41	25.16	35.41	42.584	47.77	57.719	71.20	44		
Mar. 1.4	44.261	178	53.86	24.77	37.70	42.371	50.46	57.639	71.70	50		
11.4	44.083	216	55.14	24.26	39.64	42.110	52.73	57.520	72.23	53		
21.3	43.867	241	56.19	23.60	41.15	41.813	54.54	57.372	72.73	50		
31.3	43.626	250	56.97	23.00	42.18	41.492	55.86	57.203	73.17	44		
Apr. 10.3	43.376	248	57.44	22.31	42.69	41.160	56.68	57.027	73.53	36		
20.3	43.128	232	57.60	21.61	42.67	40.828	56.98	56.853	73.78	25		
30.2	42.896	203	57.43	20.94	42.13	40.507	56.77	56.692	73.94	16		
May 10.2	42.698	168	56.95	20.33	41.09	40.207	56.07	56.551	73.98	4		
20.2	42.525	124	56.17	19.81	39.59	39.935	54.89	56.438	73.91	7		
30.1	42.401	75	55.15	19.38	37.69	39.701	53.26	56.356	73.75	16		
June 9.1	42.326	25	53.89	19.07	35.43	39.509	51.23	56.308	73.49	26		
19.1	42.301	27	52.46	18.87	32.89	39.366	48.87	56.298	73.16	33		
29.1	42.328	78	50.87	18.80	30.15	39.275	46.22	56.326	72.76	40		
July 9.0	42.406	128	49.17	18.87	27.27	39.237	43.37	56.390	72.30	46		
19.0	42.534	174	47.42	19.06	24.31	39.255	40.39	56.489	71.78	52		
29.0	42.708	220	45.62	19.37	21.34	39.328	37.39	56.623	71.21	57		
Aug. 8.0	42.928	259	43.82	19.80	18.42	39.458	34.46	56.789	70.58	63		
17.9	43.187	286	42.03	20.35	15.62	39.642	31.69	56.983	69.87	71		
27.9	43.483	328	40.31	20.99	12.99	39.879	29.20	57.206	69.11	76		
Sept. 6.9	43.811	359	38.66	21.72	10.57	40.163	27.08	57.453	68.28	83		
16.8	44.170	387	37.10	22.53	8.43	40.490	25.41	57.722	67.37	91		
26.8	44.557	408	35.66	23.40	6.58	40.857	24.27	58.013	66.39	98		
Oct. 6.8	44.965	426	34.36	24.33	5.09	41.254	23.73	58.324	65.35	104		
16.8	45.391	437	33.25	25.30	3.99	41.671	23.83	58.649	64.27	108		
26.7	45.828	442	32.33	26.29	3.31	42.099	24.56	58.985	63.16	111		
Nov. 5.7	46.270	438	31.66	27.28	3.08	42.527	25.94	59.329	62.06	110		
15.7	46.708	423	31.24	28.25	3.31	42.942	27.91	59.670	61.01	105		
25.7	47.131	399	31.12	29.18	4.02	43.332	30.43	60.004	60.04	97		
Dec. 5.6	47.530	363	31.30	30.04	5.18	43.684	33.41	60.322	59.19	85		
15.6	47.893	316	31.78	30.81	6.77	43.986	36.75	60.613	58.52	67		
25.6	48.209	268	32.56	31.46	8.76	44.230	40.36	60.869	58.02	50		
35.5	48.467	103	33.59	31.97	11.06	44.405	44.10	61.082	57.71	31		
Mean Place	40.533		51.38	17.290		29.49	40.144		33.92	54.675		75.44
Sec δ, Tan δ	1.488		+1.102	3.659		+3.520	1.652		-1.315	1.109		+0.480
D _α α, D _α α	+0.09		+0.03	+0.14		+0.11	+0.03		-0.04	+0.07		+0.02
D _ψ δ, D _ψ δ	-0.2		+0.9	-0.2		+0.9	-0.2		+0.9	-0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Geminorum. Mag. 5.0			27 Lynceis. Mag. 4.9			ρ Argus. Mag. 2.9			3 H. Ursae Majoris. Mag. 5.5		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 7 58	° ' " +28 1		h m 8 2	° ' " +51 44		h m 8 4	° ' " -24 3		h m 8 4	° ' " +68 42	
	s	"	s	s	"	s	s	"	s	s	"	
Jan. 0.6	28.149	35.17	17.056	42.15	2.725	50.49	39.94	63.26				
10.5	28.341	35.13	17.310	43.49	2.878	53.44	40.32	65.42				
20.5	28.478	35.30	17.488	45.04	2.981	56.30	40.58	67.79				
30.5	28.559	35.63	17.588	46.76	3.030	58.99	40.69	70.29				
Feb. 9.5	28.583	36.10	17.609	48.54	3.025	61.44	40.69	72.82				
19.4	28.552	36.68	17.553	50.31	2.971	63.61	40.56	75.26				
Mar. 1.4	28.472	37.30	17.429	51.98	2.875	65.48	40.32	77.51				
11.4	28.351	37.93	17.246	53.48	2.741	67.00	39.97	79.48				
21.3	28.200	38.51	17.019	54.74	2.579	68.16	39.55	81.08				
31.3	28.028	39.02	16.761	55.71	2.400	68.96	39.08	82.25				
Apr. 10.3	27.848	39.42	16.487	56.33	2.213	69.40	38.58	82.95				
20.3	27.670	39.68	16.213	56.60	2.026	69.46	38.07	83.17				
30.2	27.505	39.82	15.954	56.51	1.848	69.16	37.58	82.89				
May 10.2	27.359	39.83	15.720	56.07	1.687	68.53	37.13	82.12				
20.2	27.241	39.71	15.523	55.28	1.547	67.58	36.73	80.91				
30.2	27.156	39.45	15.369	54.20	1.435	66.32	36.40	79.29				
June 9.1	27.106	39.10	15.264	52.86	1.354	64.80	36.17	77.32				
19.1	27.092	38.65	15.213	51.28	1.304	63.04	36.01	75.07				
29.1	27.117	38.13	15.217	49.54	1.290	61.11	35.94	72.57				
July 9.0	27.179	37.53	15.274	47.65	1.310	59.07	35.98	69.91				
19.0	27.277	36.87	15.385	45.66	1.365	56.95	36.11	67.14				
29.0	27.410	36.14	15.549	43.62	1.453	54.85	36.33	64.32				
Aug. 8.0	27.576	35.36	15.759	41.55	1.575	52.83	36.63	61.51				
17.9	27.771	34.52	16.015	39.50	1.730	50.97	37.02	58.77				
27.9	27.995	33.62	16.313	37.50	1.914	49.35	37.48	56.16				
Sept. 6.9	28.245	32.67	16.650	35.57	2.129	48.04	38.01	53.70				
16.8	28.519	31.65	17.021	33.75	2.370	47.08	38.61	51.46				
26.8	28.815	30.58	17.424	32.09	2.636	46.57	39.26	49.49				
Oct. 6.8	29.129	29.47	17.854	30.58	2.922	46.53	39.96	47.81				
16.8	29.460	28.34	18.306	29.28	3.227	46.98	40.69	46.48				
26.7	29.803	27.21	18.773	28.23	3.542	47.92	41.45	45.52				
Nov. 5.7	30.152	26.12	19.248	27.45	3.863	49.35	42.21	44.98				
15.7	30.502	25.10	19.722	26.96	4.183	51.22	42.97	44.88				
25.7	30.844	24.19	20.184	26.81	4.491	53.48	43.70	45.22				
Dec. 5.6	31.169	23.44	20.622	27.00	4.781	56.05	44.38	46.01				
15.6	31.467	22.86	21.023	27.53	5.042	58.83	45.00	47.24				
25.6	31.731	22.48	21.375	28.41	5.268	61.75	45.54	48.87				
35.5	31.950	22.31	21.665	29.59	5.449	64.71	45.98	50.84				
Mean Place	25.439	40.62	13.397	49.80	0.537	51.19	34.242	71.87				
Sec δ , Tan δ	1.133	+0.532	1.615	+1.268	1.095	-0.447	2.755	+2.567				
$D\phi\alpha$, $D_\alpha\alpha$	+0.07	+0.02	+0.09	+0.04	+0.05	-0.02	+0.12	+0.09				
$D\phi\delta$, $D_\alpha\delta$	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9	-0.2	+0.9				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 2.2		ζ Cancri (mean). Mag. 4.7		Bradley 1147. Mag. 5.7		30 Puppis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 6	° ' " -47 5	h m 8 7	° ' " +17 53	h m 8 9	° ' " +76 0	h m 8 9	° ' " -15 32
	s	"	s	"	s	"	s	"
Jan. 0.6	60.903 ¹⁵³	26.22 ³⁶⁸	29.725 ¹⁸⁷	51.83 ⁷⁰	17.16 ⁵³	33.93 ²⁴¹	33.253 ¹⁶⁴	15.06 ²⁵⁷
10.5	61.056 ⁸⁵	29.90 ³⁶⁶	29.912 ¹³⁸	51.13 ⁵²	17.69 ⁸⁵	36.34 ²⁶⁶	33.417 ¹¹⁴	17.63 ²⁴⁷
20.5	61.141 ¹⁸	33.56 ³⁵²	30.050 ⁸⁵	50.61 ⁸¹	18.04 ¹⁷	39.00 ²⁷⁷	33.531 ⁶³	20.10 ²²⁹
30.5	61.159 ⁴⁹	37.08 ³³²	30.135 ³¹	50.30 ¹⁴	18.21 ³	41.77 ²⁷⁸	33.594 ¹²	22.39 ²⁰⁸
Feb. 9.5	61.110 ¹⁰⁹	40.40 ³⁰³	30.166 ²⁰	50.16 ²	18.18 ²²	44.55 ²⁶⁹	33.606 ³⁶	24.45 ¹⁸¹
19.4	61.001 ¹⁶⁴	43.43 ²⁶⁷	30.146 ⁶⁶	50.18 ¹³	17.96 ³⁸	47.24 ²⁴⁶	33.570 ⁸⁰	26.26 ¹⁵²
Mar. 1.4	60.837 ²⁰⁹	46.10 ²²⁶	30.080 ¹⁰⁵	50.31 ²⁴	17.58 ⁵³	49.70 ²¹⁴	33.490 ¹¹⁶	27.78 ¹²¹
11.4	60.628 ²⁴³	48.36 ¹⁸³	29.975 ¹³³	50.55 ²⁸	17.05 ⁶⁵	51.84 ¹⁷³	33.374 ¹⁴²	28.99 ⁹²
21.3	60.385 ²⁶⁸	50.19 ¹³⁶	29.842 ¹⁵³	50.83 ³⁰	16.40 ⁷⁸	53.57 ¹²⁷	33.232 ¹⁶²	29.91 ⁶⁰
31.3	60.117 ²⁸⁰	51.55 ⁸⁸	29.689 ¹⁶³	51.13 ³¹	15.67 ⁷³	54.84 ⁷⁶	33.070 ¹⁶⁹	30.51 ³⁰
Apr. 10.3	59.837 ²⁸²	52.43 ³⁸	29.526 ¹⁶²	51.44 ²⁸	14.89 ⁸⁰	55.60 ²¹	32.901 ¹⁷⁰	30.81 ¹
20.3	59.555 ²⁷⁴	52.81 ¹¹	29.364 ¹⁵³	51.72 ²⁵	14.09 ⁷⁷	55.81 ⁸²	32.731 ¹⁶¹	30.82 ²⁹
30.2	59.281 ²⁵⁶	52.70 ⁵⁸	29.211 ¹³⁶	51.97 ²¹	13.32 ⁷²	55.49 ⁸⁵	32.570 ¹⁴⁶	30.53 ⁵⁶
May 10.2	59.025 ²³³	52.12 ¹⁰⁴	29.075 ¹¹¹	52.18 ¹⁷	12.60 ⁶⁴	54.64 ¹⁸⁴	32.424 ¹²⁴	29.97 ⁸²
20.2	58.792 ²⁰⁰	51.08 ¹⁴⁸	28.964 ⁸³	52.35 ¹³	11.96 ⁵⁵	53.30 ¹⁷⁸	32.300 ¹⁰⁰	29.15 ¹⁰⁶
30.2	58.592 ¹⁶³	49.60 ¹⁸⁶	28.881 ⁵¹	52.48 ⁹	11.41 ⁴³	51.52 ²¹⁷	32.200 ⁷⁰	28.10 ¹²⁸
June 9.1	58.429 ¹²³	47.74 ²²⁰	28.830 ¹⁸	52.57 ⁵	10.98 ³⁰	49.35 ²⁵⁰	32.130 ³⁸	26.82 ¹⁴⁵
19.1	58.306 ⁷⁸	45.54 ²⁴⁹	28.812 ¹⁷	52.62 ¹	10.68 ¹⁵	46.85 ²⁷⁴	32.092 ⁸	25.37 ¹⁵⁸
29.1	58.228 ³¹	43.05 ²⁶⁹	28.829 ⁵⁰	52.63 ³	10.53 ²	44.11 ²⁹²	32.084 ²⁶	23.79 ¹⁶⁹
July 9.0	58.197 ¹⁵	40.36 ²⁸²	28.879 ⁸⁴	52.60 ⁹	10.51 ¹²	41.19 ³⁰⁶	32.110 ⁵⁸	22.10 ¹⁷²
19.0	58.212 ⁶⁴	37.54 ²⁸⁶	28.963 ¹¹⁵	52.51 ¹⁶	10.63 ²⁷	38.13 ³⁰⁹	32.168 ⁸⁹	20.38 ¹⁷⁰
29.0	58.276 ¹¹³	34.68 ²⁸¹	29.078 ¹⁴⁵	52.35 ²⁴	10.90 ⁴⁰	35.04 ³⁰⁸	32.257 ¹²¹	18.68 ¹⁶¹
Aug. 8.0	58.389 ¹⁸⁰	31.87 ²⁶⁵	29.223 ¹⁷⁴	52.11 ³²	11.30 ⁵³	31.96 ²⁹⁹	32.378 ¹⁵¹	17.07 ¹⁴⁷
17.9	58.549 ²⁰⁷	29.22 ²⁴²	29.397 ²⁰⁰	51.79 ⁴²	11.83 ⁶⁵	28.97 ²⁸⁶	32.529 ¹⁷⁸	15.60 ¹²⁶
27.9	58.756 ²⁵⁰	26.80 ²⁰⁷	29.597 ²²⁴	51.37 ⁵⁵	12.48 ⁷⁶	26.11 ²⁶⁶	32.707 ²⁰⁶	14.34 ⁹⁸
Sept. 6.9	59.006 ²⁹⁰	24.73 ¹⁶³	29.821 ²⁴⁹	50.82 ⁷⁰	13.24 ⁸⁵	23.45 ²⁴²	32.913 ²³¹	13.36 ⁶⁵
16.9	59.296 ³²⁴	23.10 ¹¹³	30.070 ²⁷⁰	50.12 ⁸²	14.09 ⁹⁴	21.03 ²¹¹	33.144 ²⁵⁶	12.71 ²⁶
26.8	59.620 ³⁵⁵	21.97 ⁵⁷	30.340 ²⁸⁹	49.30 ⁹⁶	15.03 ¹⁰⁰	18.92 ¹⁷⁷	33.400 ²⁷⁵	12.45 ¹⁵
Oct. 6.8	59.975 ³⁷⁷	21.40 ⁶	30.629 ³⁰⁷	48.34 ¹⁰⁹	16.03 ¹⁰⁶	17.15 ¹³⁹	33.675 ²⁹²	12.60 ⁵⁸
16.8	60.352 ³⁹¹	21.46 ⁶⁸	30.936 ³¹⁹	47.25 ¹²⁰	17.09 ¹¹⁰	15.76 ⁹⁶	33.967 ³⁰⁶	13.18 ¹⁰⁰
26.7	60.743 ³⁹⁵	22.14 ¹²⁹	31.255 ³²⁶	46.05 ¹²⁷	18.19 ¹¹⁰	14.80 ⁶⁰	34.273 ³¹²	14.18 ¹⁴¹
Nov. 5.7	61.138 ³⁸⁹	23.43 ¹⁸⁹	31.581 ³²⁸	44.78 ¹³⁰	19.29 ¹¹⁰	14.30 ²	34.585 ³¹³	15.59 ¹⁷⁹
15.7	61.527 ³⁷⁰	25.32 ²⁴²	31.909 ³²³	43.48 ¹²⁹	20.39 ¹⁰⁶	14.28 ⁴⁹	34.898 ³⁰⁴	17.38 ²¹¹
25.7	61.897 ³⁴⁰	27.74 ²⁸⁷	32.232 ³⁰⁸	42.19 ¹²⁴	21.45 ⁹⁰	15.77 ¹⁴⁴	35.202 ²⁸⁹	19.49 ²³⁴
Dec. 5.6	62.237 ³⁰⁰	30.61 ³²³	32.540 ²⁸⁵	40.95 ¹¹²	22.45 ⁹⁰	15.74 ⁹⁷	35.491 ²⁶³	21.83 ²⁵²
15.6	62.537 ²⁴⁹	33.84 ³⁴⁹	32.825 ²⁵³	39.83 ¹⁰⁰	23.35 ⁷⁷	17.18 ¹⁸⁶	35.754 ²³¹	24.35 ²⁶¹
25.6	62.786 ¹⁸⁹	37.33 ³⁶⁴	33.078 ²¹³	38.83 ⁸²	24.12 ⁶²	19.04 ²²⁴	35.985 ¹⁸⁹	26.96 ²⁶¹
35.6	62.975	40.97	33.291	38.01	24.74	21.28	36.174	29.57
Mean Place	58.547	29.77	27.241	56.75	9.080	43.16	31.072	14.58
Sec δ , Tan δ	1.469	-1.076	1.050	+0.323	4.137	+4.014	1.038	-0.278
$D\alpha$, D_{α}	+0.04	-0.04	+0.07	+0.01	+0.15	+0.14	+0.05	-0.01
$D\delta$, D_{δ}	-0.2	+0.9	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Canori. Mag. 3.8		δ Lynxis. Mag. 4.4		δ^1 Canori. Mag. 5.9		ϵ Argus. Mag. 1.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	8 12	+ 9 26	8 17	+43 26	8 18	+18 35	8 20	-59 14
	s	"	s	"	s	"	s	"
Jan. 0.6	3.269 ¹⁸³	27.87 ¹²²	12.810 ²⁴⁵	71.30 ⁸⁰	39.281 ²⁰⁰	52.67 ⁷⁰	51.344 ¹⁸²	26.23 ³⁸⁵
10.5	3.452 ¹³⁵	26.65 ¹⁰⁵	13.055 ¹⁸¹	72.10 ¹⁰³	39.481 ¹⁴⁹	51.97 ⁵⁰	51.526 ⁹⁷	30.08 ³⁸⁸
20.5	3.587 ⁸³	25.60 ⁸⁷	13.236 ¹¹⁴	73.13 ¹²³	39.630 ⁹⁶	51.47 ²⁹	51.623 ¹⁰	33.96 ³⁸²
30.5	3.670 ³²	24.73 ⁶⁴	13.350 ⁴⁴	74.36 ¹³⁵	39.726 ⁴²	51.18 ¹¹	51.633 ⁷⁴	37.78 ³⁶⁵
Feb. 9.5	3.702 ¹⁷	24.09 ⁴⁶	13.394 ²¹	75.71 ¹⁴²	39.768 ⁹	51.07 ⁶	51.559 ¹⁶⁴	41.43 ³³⁸
19.4	3.685	23.63 ²⁹	13.373	77.13 ¹⁴⁰	39.759	51.13 ¹⁸	51.405 ²²⁴	44.81 ³⁰⁶
Mar. 1.4	3.623 ⁶²	23.34 ¹⁴	13.290 ⁸³	78.53 ¹³²	39.702 ⁵⁷	51.31 ²⁹	51.181 ²⁸⁴	47.87 ²⁶⁷
11.4	3.524 ⁹⁰	23.20 ²	13.154 ¹³⁶	79.85 ¹¹⁵	39.606 ⁹⁶	51.60 ³⁴	50.897 ³³⁰	50.54 ²²⁴
21.4	3.396 ¹²⁸	23.18 ⁹	12.977 ²⁰⁵	81.00 ⁷⁰	39.477 ¹²⁹	51.94 ³⁶	50.567 ³⁸⁶	52.78 ¹⁷⁶
31.3	3.249 ¹⁴⁷	23.27 ¹⁸	12.772 ²²¹	81.95 ⁹⁵	39.329 ¹⁴⁸	52.30 ⁸⁶	50.201 ³⁶⁶	54.54 ¹²⁶
Apr. 10.3	3.093	23.45 ²⁵	12.551 ²²⁴	82.65 ⁴³	39.169 ¹⁶¹	52.66 ⁸³	49.815 ³⁹⁵	55.80 ⁷⁴
20.3	2.937 ¹⁵⁶	23.70 ²⁹	12.327 ²¹⁴	83.08 ¹³	39.008 ¹⁵⁴	52.99 ²⁹	49.420 ³⁷²	56.54 ²¹
30.2	2.789 ¹⁴⁸	23.99 ³³	12.113 ¹⁹⁶	83.21 ¹⁶	38.854 ¹³⁹	53.28 ²³	49.028 ³⁸⁷	56.75 ³¹
May 10.2	2.658 ¹³¹	24.32 ³⁸	11.917 ¹⁶⁷	83.05 ⁴²	38.715 ¹¹⁶	53.51 ¹⁹	48.651 ³⁵⁰	56.44 ⁸²
20.2	2.549 ¹⁰⁹	24.70 ⁴⁰	11.750 ¹³²	82.63 ⁷⁰	38.599 ⁹⁰	53.70 ¹³	48.301 ³¹⁶	55.62 ¹³⁰
30.2	2.466 ⁵⁴	25.10 ⁴²	11.618 ⁹³	81.93 ⁹³	38.509 ⁵⁹	53.83 ⁸	47.985 ²⁷³	54.32 ¹⁷⁵
June 9.1	2.412 ²¹	25.52 ⁴⁴	11.525 ⁴⁸	81.00 ¹¹⁴	38.450 ²⁶	53.91 ²	47.712 ²²⁶	52.57 ²¹⁵
19.1	2.391 ¹¹	25.96 ⁴⁵	11.477 ⁴	79.86 ¹³¹	38.424 ⁶	53.93 ⁸	47.487 ¹⁶⁹	50.42 ²⁴⁹
29.1	2.402 ⁴²	26.41 ³⁹	11.473 ⁸⁵	78.55 ¹⁵⁶	38.430 ⁷³	53.90 ¹⁵	47.318 ⁴⁴	47.93 ²⁹⁴
July 9.1	2.444 ⁷⁴	26.84 ³⁴	11.513 ¹²⁸	77.10 ¹⁶⁶	38.470 ¹⁰⁵	53.82 ²⁸	47.209 ²⁰	45.18 ³⁰⁴
19.0	2.518	27.23 ²⁴	11.598 ¹⁶⁸	75.54 ¹⁷¹	38.543 ¹³⁴	53.67 ³⁰	47.165 ⁸⁹	42.24 ³⁰³
29.0	2.622 ¹³²	27.57 ¹⁵	11.726 ²⁰⁶	73.88 ¹⁷⁴	38.648 ¹⁶³	53.44 ⁴⁰	47.185 ¹⁵⁶	39.20 ²⁹³
Aug. 8.0	2.754 ¹⁶¹	27.81 ⁰	11.894 ²⁴³	72.17 ¹⁷⁵	38.782 ¹⁹⁰	53.14 ⁵¹	47.274 ²⁸⁵	36.17 ²⁷²
17.9	2.915 ²¹²	27.96 ¹⁸	12.100 ²⁷⁶	70.43 ¹⁷⁵	38.945 ²¹⁷	52.74 ⁶³	47.430 ²³⁵	33.24 ²⁴¹
27.9	3.102 ¹⁸⁷	27.96 ³⁵	12.343 ³⁰⁹	68.68 ¹⁷¹	39.135 ²⁴⁰	52.23 ⁷⁷	47.651 ³⁴⁴	30.52 ¹⁹⁹
Sept. 6.9	3.314	27.78 ⁵⁷	12.619 ³³⁶	66.93 ¹⁵⁶	39.352 ²⁸⁵	51.60 ¹⁰³	47.936 ⁴³⁸	28.11 ⁹³
16.9	3.548 ²⁵⁸	27.43 ⁷⁹	12.928 ³⁸⁵	65.22 ¹⁴⁴	39.592 ³¹⁸	50.83 ¹²⁶	48.280 ⁴⁹⁴	26.12 ³⁵
26.8	3.806 ³¹⁶	26.86 ¹³⁵	13.264 ⁴¹³	63.59 ¹⁰⁸	39.856 ³²⁷	49.93 ¹³²	48.675 ⁴⁹⁹	24.63 ¹⁰²
Oct. 6.8	4.082 ³¹⁷	26.07 ¹⁴⁷	13.628 ⁴¹⁷	62.03 ⁸⁶	40.141 ³³¹	48.90 ¹³⁶	48.675 ⁴⁹¹	23.70 ¹⁶⁵
16.8	4.375 ²⁹³	25.09 ¹⁵⁵	14.013 ⁴¹⁰	60.59 ⁵⁹	40.445 ³²⁷	47.73 ¹³⁴	49.113 ⁴⁶⁸	23.41 ²²⁵
26.8	4.682 ³⁰⁷	23.89 ¹⁵⁷	14.416 ³⁹³	59.31 ³⁰	40.763 ³¹⁶	46.47 ¹²⁷	49.584 ⁴²⁸	23.76 ²⁷⁷
Nov. 5.7	4.998 ³¹⁶	22.54 ¹⁵⁴	14.829 ³⁶⁶	58.23 ⁰	41.090 ²⁹³	45.15 ¹¹⁵	50.078 ³⁷⁴	23.76 ³²¹
15.7	5.315 ³¹⁷	21.07 ¹⁴⁶	15.246 ³²⁶	57.37 ⁸²	41.421 ²⁶²	43.79 ¹⁰¹	50.577 ³¹⁰	24.78 ³⁵⁴
25.7	5.627 ²⁹⁹	19.52 ¹³²	15.656 ²⁷⁶	56.78 ⁶²	41.748 ²²⁵	42.45 ⁸³	51.068 ²³²	26.43 ³⁷⁵
Dec. 5.6	5.926 ²⁷⁸	17.95 ¹²²	16.049 ²¹⁷	56.48 ⁶²	42.064 ²²⁵	41.18 ⁸³	51.536 ²³²	28.68 ³⁷⁵
15.6	6.204 ²⁴⁶	16.41 ¹⁴⁶	16.415 ³²⁶	56.48 ⁶²	42.357 ²⁶²	40.03 ¹⁰¹	51.964 ³⁷⁴	31.45 ³²¹
25.6	6.450 ²⁰⁷	14.95 ¹⁴⁶	16.741 ³²⁶	56.80 ⁶²	42.619 ²⁶²	39.02 ¹⁰¹	52.338 ³¹⁰	34.66 ³⁵⁴
35.6	6.657 ²⁰⁷	13.63 ¹³²	17.017 ²⁷⁶	57.42 ⁶²	42.844 ²²⁵	38.19 ⁸³	52.648 ²³²	38.20 ³⁷⁵
Mean Place	0.915	31.93	9.656	79.70	36.816	58.31	48.714	81.56
Sec δ , Tan δ	1.014	+0.166	1.378	+0.948	1.055	+0.336	1.955	-1.680
$D_\psi \alpha$, $D_\omega \alpha$	+0.06	+0.01	+0.08	+0.04	+0.07	+0.01	+0.02	-0.06
$D_\psi \delta$, $D_\omega \delta$	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Monocerotis. Mag. 4.0		θ Chamaleontis. Mag. 4.3		O Ursae Majoris. Mag. 3.5		Groombridge 1450. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s	° ' " — 3 38	h m s	° ' " — 77 12	h m s	° ' " +60 59	h m s	° ' " +38 17
Jan. 0.6	33.077 ¹⁸¹	7.88 ²⁰⁰	13.60 ²⁷	55.33 ³⁸⁰	27.29 ³⁴	38.51 ¹⁶⁸	34.451 ²⁴²	58.47 ⁴²
10.5	33.258 ¹³⁴	9.88 ¹⁸⁵	13.87 ⁸	59.13 ³⁹⁰	27.63 ²⁴	40.19 ¹⁸⁵	34.693 ¹⁸⁴	58.89 ⁷⁰
20.5	33.392 ⁸⁵	11.73 ¹⁶⁶	13.95 ¹²	63.03 ³⁸⁸	27.87 ¹⁵	42.14 ²¹⁴	34.877 ¹²¹	59.59 ⁹⁰
30.5	33.477 ³³	13.39 ¹⁴⁶	13.83 ³⁰	66.91 ³⁷⁶	28.02 ⁵	44.28 ²²³	34.998 ⁵⁷	60.49 ¹⁰⁶
Feb. 9.5	33.510 ¹⁵	14.85 ¹²¹	13.53 ⁴⁶	70.67 ³⁵⁴	28.07 ⁵	46.51 ²²³	35.065 ⁶	61.55 ¹¹⁷
19.4	33.495 ⁵⁸	16.06 ⁹⁸	13.07 ⁶²	74.21 ³²⁷	28.02 ¹⁴	48.74 ²¹²	35.049 ⁶³	62.72 ¹²⁰
Mar. 1.4	33.437 ⁹⁵	17.04 ⁷⁴	12.45 ⁷⁷	77.48 ²⁹¹	27.88 ²¹	50.86 ¹⁹³	34.986 ¹¹⁴	63.92 ¹¹⁶
11.4	33.342 ¹²⁵	17.78 ⁵²	11.71 ⁸⁴	80.39 ²⁴⁹	27.67 ²⁸	52.79 ¹⁶⁴	34.872 ¹⁵³	65.08 ¹⁰⁷
21.4	33.217 ¹⁴³	18.30 ²⁹	10.87 ⁹³	82.88 ²⁰³	27.39 ³³	54.43 ¹³⁰	34.719 ¹⁸⁰	66.15 ⁹¹
31.3	33.074 ¹⁵⁴	18.59 ¹⁰	9.94 ⁹⁸	84.91 ¹⁵⁵	27.06 ³⁵	55.73 ⁹⁰	34.539 ¹⁹⁸	67.06 ⁷²
Apr. 10.3	32.920 ¹⁵⁶	18.69 ¹⁰	8.96 ¹⁰¹	86.46 ¹⁰³	26.71 ³⁷	56.63 ⁴⁸	34.341 ²⁰²	67.78 ⁵¹
20.3	32.764 ¹⁴⁹	18.59 ²⁹	7.95 ¹⁰²	87.49 ⁴⁹	26.34 ³⁵	57.11 ³	34.139 ¹⁹⁶	68.29 ²⁵
30.2	32.615 ¹³⁶	18.30 ⁴⁵	6.93 ⁹⁹	87.98 ⁴	25.99 ³²	57.14 ⁴⁰	33.944 ¹⁸⁰	68.54 ¹
May 10.2	32.479 ¹¹⁵	17.85 ⁶⁰	5.94 ⁹⁵	87.94 ⁵⁷	25.66 ³⁰	56.74 ⁸³	33.764 ¹⁵⁴	68.55 ²⁸
20.2	32.364 ⁹⁰	17.25 ⁷⁵	4.99 ⁸⁸	87.37 ¹⁰⁸	25.36 ²⁴	55.91 ¹²¹	33.610 ¹²⁴	68.32 ⁴⁶
30.2	32.274 ⁶⁵	16.50 ⁸⁶	4.11 ⁸⁰	86.29 ¹⁵⁷	25.12 ¹⁹	54.70 ¹⁵⁶	33.486 ⁸⁸	67.86 ⁶⁸
June 9.1	32.209 ³⁴	15.64 ⁹⁷	3.31 ⁶⁹	84.72 ¹⁹⁹	24.93 ¹³	53.14 ¹⁸⁵	33.398 ⁵¹	67.18 ⁸⁶
19.1	32.175 ⁵	14.67 ¹⁰⁵	2.62 ⁵⁵	82.73 ²⁸⁷	24.80 ⁵	51.29 ²¹¹	33.347 ¹⁰	66.32 ¹⁰²
29.1	32.170 ²⁷	13.62 ¹⁰⁹	2.07 ⁴²	80.36 ²⁷⁰	24.75 ¹	49.18 ²³⁰	33.337 ³⁰	65.30 ¹¹⁸
July 9.1	32.197 ⁵⁷	12.53 ¹⁰⁹	1.65 ²⁷	77.66 ²⁹²	24.76 ⁸	46.88 ²⁴⁵	33.367 ⁷⁰	64.12 ¹²⁹
19.0	32.254 ⁸⁶	11.44 ¹⁰⁵	1.38 ¹¹	74.74 ³⁰⁷	24.84 ¹⁴	44.43 ²⁶⁴	33.437 ¹⁰⁹	62.83 ¹³⁹
29.0	32.340 ¹¹⁵	10.39 ⁹⁷	1.27 ⁶	71.67 ³¹¹	24.98 ²⁰	41.89 ²⁵⁹	33.546 ¹⁴⁵	61.44 ¹⁴⁷
Aug. 8.0	32.455 ¹⁴³	9.42 ⁸⁵	1.33 ²³	68.56 ³⁰⁴	25.18 ²⁷	39.30 ²⁶⁷	33.691 ¹⁸²	59.97 ¹⁵⁴
17.9	32.598 ¹⁷¹	8.57 ⁶⁶	1.55 ⁴⁰	65.52 ²⁸⁹	25.45 ³³	36.73 ²⁶³	33.873 ²¹⁵	58.43 ¹⁵⁸
27.9	32.769 ¹⁹⁷	7.91 ⁴⁴	1.95 ⁵⁵	62.63 ²⁹⁰	25.78 ³⁸	34.20 ²⁴³	34.088 ²⁴⁷	56.85 ¹⁶⁰
Sept. 6.9	32.966 ²²²	7.47 ¹⁷	2.50 ⁷⁰	60.03 ²²²	26.16 ⁴⁴	31.77 ²²⁰	34.335 ²⁷⁷	55.25 ¹⁶¹
16.9	33.188 ²⁴⁴	7.30 ¹³	3.20 ⁸²	57.81 ¹⁷⁵	26.60 ⁴⁷	29.48 ²¹⁰	34.612 ³⁰⁷	53.64 ¹⁶⁰
26.8	33.432 ²⁶⁷	7.43 ⁴⁵	4.02 ⁹²	56.06 ¹²¹	27.07 ⁵¹	27.38 ¹⁸⁸	34.919 ³³¹	52.04 ¹⁵⁷
Oct. 6.8	33.699 ²⁸⁴	7.88 ⁷⁸	4.94 ¹⁰⁰	54.85 ⁵⁹	27.58 ⁵⁵	25.50 ¹⁶⁰	35.250 ³⁵⁵	50.47 ¹⁵⁰
16.8	33.983 ³⁰⁰	8.66 ¹¹¹	5.94 ¹⁰³	54.26 ⁸	28.13 ⁵⁷	23.90 ¹²⁹	35.605 ³⁷²	48.97 ¹³⁹
26.8	34.283 ³⁰⁹	9.77 ¹⁴⁰	6.97 ¹⁰⁵	54.34 ⁷³	28.70 ⁵⁸	22.61 ⁹⁵	35.977 ³⁸⁶	47.58 ¹²⁶
Nov. 5.7	34.592 ³¹¹	11.17 ¹⁶⁷	8.02 ¹⁰¹	55.07 ¹⁴⁰	29.28 ⁵⁹	21.66 ⁵⁵	36.363 ³⁹¹	46.32 ¹⁰⁷
15.7	34.903 ³⁰⁷	12.84 ¹⁸⁷	9.03 ⁹⁴	56.47 ²⁰⁰	29.87 ⁵⁸	21.11 ¹⁵	36.754 ³⁸⁸	45.25 ⁸⁶
25.7	35.210 ²⁹⁶	14.71 ²⁰²	9.97 ⁸⁵	58.47 ²⁵⁶	30.45 ⁵⁵	20.96 ²⁸	37.142 ³⁷⁵	44.39 ⁶⁰
Dec. 5.6	35.506 ²⁷⁴	16.73 ²¹¹	10.82 ⁷⁰	61.03 ³⁰⁴	31.00 ⁵¹	21.24 ⁷¹	37.517 ³⁵⁰	43.79 ³²
15.6	35.780 ²⁴³	18.84 ²¹¹	11.52 ⁵⁶	64.07 ³⁴²	31.51 ⁴⁴	21.95 ¹¹¹	37.867 ³¹⁵	43.47 ⁴
25.6	36.023 ²⁰⁵	20.95 ²⁰⁶	12.08 ⁸⁸	67.49 ³⁶⁸	31.95 ³⁹	23.06 ¹⁴⁸	38.182 ²⁷¹	43.43 ²⁶
35.6	36.228	23.01	12.46	71.17	32.34	24.54	38.453	43.69
Mean Place	30.868	5.42	9.121	62.21	22.930	48.78	31.536	67.19
Sec δ , Tan δ	1.002	-0.064	4.520	-4.409	2.063	+1.804	1.274	+0.790
$D\psi\alpha$, $D_\alpha\alpha$	+0.06	0.00	-0.03	-0.17	+0.10	+0.07	+0.08	+0.03
$D\psi\delta$, $D_\alpha\delta$	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8	-0.2	+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	77 Cancri. Mag. 5.5			Groombridge 1446. Mag. 6.3			δ Hydræ. Mag. 4.2			σ Hydræ. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 8 27	s 27	° ' " +20 43	h m 8 30	s 30	° ' " +73 54	h m 8 33	s 33	° ' " + 5 59	h m 8 34	s 34	° ' " + 3 37
Jan. 0.6	57.185		19.66	37.62		65.01	18.077		33.91	27.474		57.15
10.6	57.396	211	19.05	38.16	54	67.19	18.276	199	32.41	27.873	199	55.52
20.5	57.557	161	18.65	38.55	39	69.65	18.429	153	31.08	27.825	152	54.06
30.5	57.664	107	18.48	38.77	22	72.31	18.532	103	29.97	27.927	103	52.80
Feb. 9.5	57.716	53	18.49	38.83	6	75.04	18.583	51	29.07	27.978	51	51.74
19.4	57.716	0	18.68	38.72	11	77.74	18.584	1	28.38	27.980	2	50.91
Mar. 1.4	57.667	49	18.99	38.45	27	80.28	18.540	44	27.89	27.937	43	50.30
11.4	57.576	91	19.38	38.05	40	82.57	18.457	83	27.59	27.855	82	49.88
21.4	57.452	124	19.82	37.54	51	84.50	18.343	114	27.45	27.741	114	49.64
31.3	57.306	146	20.27	36.95	59	86.00	18.209	134	27.45	27.607	134	49.56
Apr. 10.3	57.146	160	20.70	36.29	66	87.02	18.061	148	27.57	27.460	147	49.63
20.3	56.984	162	21.08	35.61	51	87.53	17.909	152	27.81	27.309	151	49.83
30.3	56.827	157	21.41	34.94	67	87.50	17.763	146	28.12	27.163	146	50.13
May 10.2	56.685	142	21.64	34.30	84	86.96	17.629	134	28.50	27.029	134	50.52
20.2	56.565	120	21.81	33.71	59	85.92	17.513	116	28.95	26.914	115	51.00
30.2	56.469	96	21.90	33.19	52	84.40	17.420	93	29.44	26.820	94	51.55
June 9.1	56.404	65	21.91	32.77	42	82.49	17.355	65	29.98	26.753	67	52.16
19.1	56.370	34	21.85	32.46	31	80.20	17.317	38	30.54	26.713	40	52.82
29.1	56.368	2	21.72	32.27	19	77.61	17.309	8	31.12	26.704	9	53.51
July 9.1	56.400	32	21.50	32.19	8	74.80	17.332	23	31.70	26.725	21	54.20
19.0	56.465	65	21.22	32.24	5	71.84	17.384	52	32.24	26.775	54	54.87
29.0	56.560	95	20.85	32.41	17	68.76	17.466	82	32.73	26.855	80	55.49
Aug. 8.0	56.687	127	20.40	32.69	28	65.67	17.577	111	33.13	26.963	108	56.02
18.0	56.843	156	19.85	33.09	40	62.58	17.715	138	33.40	27.098	135	56.43
27.9	57.026	183	19.18	33.59	50	59.60	17.881	166	33.63	27.262	164	56.68
Sept. 6.9	57.237	211	18.40	34.19	60	56.76	18.072	191	33.47	27.451	189	56.74
16.9	57.473	236	17.50	34.89	70	54.13	18.290	218	33.20	27.666	215	56.57
26.8	57.735	262	16.48	35.66	77	51.76	18.531	241	32.70	27.905	239	56.18
Oct. 6.8	58.018	283	15.33	36.50	84	49.68	18.795	264	31.95	28.168	263	55.50
16.8	58.322	304	14.08	37.40	90	47.98	19.078	283	30.97	28.449	281	54.56
26.8	58.642	320	12.75	38.34	94	46.66	19.379	301	29.74	28.748	299	53.36
Nov. 5.7	58.973	331	11.38	39.30	96	45.80	19.690	311	28.32	29.059	311	51.94
15.7	59.310	337	10.00	40.27	97	45.41	20.007	317	26.72	29.375	316	50.31
25.7	59.645	335	8.66	41.22	95	45.51	20.323	316	25.02	29.689	314	48.56
Dec. 5.7	59.969	324	7.41	42.13	91	46.11	20.628	305	23.26	29.993	304	46.73
15.6	60.273	304	6.30	42.96	83	47.21	20.916	288	21.50	30.279	286	44.87
25.6	60.545	272	5.35	43.70	74	48.77	21.174	258	19.80	30.536	257	43.06
35.6	60.780	235	4.61	44.31	61	50.74	21.396	222	18.22	30.759	223	41.34
Mean Place	54.709		26.13	30.691		76.50	15.820		38.31	25.244		61.20
Sec δ , Tan δ	1.069		+0.378	3.610		+3.469	1.005		+0.105	1.002		+0.063
D ψ α , D ω α	+0.07		+0.02	+0.13		+0.14	+0.06		0.00	+0.06		0.00
D ψ δ , D ω δ	-0.2		+0.8	-0.2		+0.8	-0.2		+0.8	-0.2		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cancri. Mag. 4.7			δ Cancri. Mag. 4.2			α Pyxidis. Mag. 3.7			ϵ Cancri. Mag. 4.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	8 38		+21 45	8 39		+18 27	8 40		-32 53	8 41		+29 3
Jan. 0.6	31.613		56.93	60.655		29.68	17.498		9.40	43.335		43.04
10.6	31.835	222	56.33	60.874	219	28.87	17.691	193	12.70	43.571	236	42.86
20.5	32.007	172	55.96	61.044	170	28.29	17.830	139	15.97	43.755	184	42.93
30.5	32.126	119	55.82	61.162	118	27.93	17.913	83	19.14	43.884	129	43.24
Feb. 9.5	32.190	64	55.88	61.226	64	27.79	17.939	26	22.11	43.955	71	43.75
19.4	32.201	11	56.13	61.237	11	27.82	17.911	28	24.85	43.968	13	44.42
Mar. 1.4	32.162	39	56.50	61.200	37	28.02	17.833	78	27.27	43.928	40	45.19
11.4	32.079	83	56.96	61.120	80	28.32	17.713	130	29.35	43.842	86	46.01
21.4	31.962	117	57.48	61.006	114	28.70	17.559	154	31.06	43.718	124	46.82
31.3	31.820	142	58.00	60.869	137	29.12	17.381	178	32.37	43.568	150	47.58
Apr. 10.3	31.664	156	58.49	60.717	152	29.54	17.187	194	33.29	43.400	168	48.23
20.3	31.502	162	58.93	60.560	167	29.94	16.987	200	33.78	43.227	173	48.77
30.3	31.345	157	59.30	60.407	153	30.30	16.789	198	33.86	43.058	169	49.16
May 10.2	31.200	145	59.58	60.266	141	30.60	16.601	188	33.54	42.901	157	49.38
20.2	31.074	126	59.76	60.144	122	30.84	16.430	171	32.83	42.763	138	49.44
30.2	30.972	102	59.85	60.045	99	31.02	16.282	148	31.74	42.652	111	49.35
June 9.1	30.899	73	59.85	59.974	71	31.13	16.159	123	30.33	42.570	82	49.08
19.1	30.856	43	59.76	59.931	43	31.18	16.065	94	28.61	42.519	51	48.68
29.1	30.846	10	59.58	59.920	11	31.15	16.003	62	26.64	42.503	16	48.15
July 9.1	30.868	22	59.30	59.941	21	31.06	15.976	27	24.47	42.521	18	47.48
19.0	30.921	53	58.95	59.992	51	30.89	15.985	9	22.18	42.573	52	46.71
29.0	31.008	87	58.50	60.075	83	30.62	16.029	44	19.83	42.660	87	45.83
Aug. 8.0	31.125	117	57.95	60.187	112	30.26	16.109	80	17.50	42.779	119	44.85
18.0	31.270	145	57.31	60.328	141	29.80	16.227	118	15.28	42.930	151	43.77
27.9	31.445	175	56.54	60.498	170	29.21	16.381	154	13.26	43.111	181	42.59
Sept. 6.9	31.648	208	55.66	60.696	198	28.48	16.570	189	11.52	43.322	211	41.34
16.9	31.877	229	54.67	60.919	228	27.62	16.795	225	10.14	43.561	239	40.01
26.8	32.133	256	53.55	61.168	249	26.61	17.051	256	9.18	43.828	267	38.61
Oct. 6.8	32.412	279	52.32	61.440	272	25.46	17.338	287	8.71	44.121	293	37.15
16.8	32.713	301	50.99	61.736	296	24.18	17.650	312	8.77	44.437	316	35.66
26.8	33.031	318	49.59	62.048	312	22.79	17.980	330	8.77	44.773	336	34.18
Nov. 5.7	33.363	332	48.15	62.374	326	21.33	18.323	343	9.37	45.123	350	32.74
15.7	33.702	339	46.72	62.708	334	19.84	18.670	347	10.52	45.481	358	31.38
25.7	34.041	389	45.34	63.041	333	18.37	19.012	342	12.19	45.839	358	30.15
Dec. 5.7	34.371	330	44.05	63.366	329	16.96	19.339	327	14.34	46.188	349	29.09
15.6	34.682	311	42.92	63.672	306	15.67	19.640	301	16.90	46.518	330	28.24
25.6	34.965	283	41.96	63.952	280	14.55	19.906	266	19.78	46.818	300	27.64
35.6	35.210	245	41.23	64.193	241	13.61	20.127	221	22.90	47.080	262	27.30
Mean Place	29.155		64.17	58.256		36.47	15.384		11.68	40.736		51.60
Sec δ , Tan δ	1.077		+0.399	1.054		+0.334	1.191		-0.647	1.144		+0.556
$D\psi a$, $D_\omega a$	+0.07		+0.02	+0.07		+0.01	+0.05		-0.03	+0.07		+0.02
$D\psi \delta$, $D_\omega \delta$	-0.3		+0.8	-0.3		+0.8	-0.3		+0.8	-0.3		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Hydræ. Mag. 3.5		δ Argus. Mag. 2.0		σ^3 Cancri (<i>mean</i>). Mag. 5.5		ζ Hydræ. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 42	° ' " + 6 43	h m 8 42	° ' " -54 24	h m 8 49	° ' " +30 53	h m 8 51	° ' " + 6 15
Jan. 0.6	25.176	22.07	26.884	8.94	13.700	31.17	2.708	38.69
10.6	25.384	20.58	27.099	12.70	13.947	31.05	2.923	37.15
20.5	25.545	19.28	27.239	16.53	14.143	31.20	3.093	35.79
30.5	25.657	18.19	27.302	20.33	14.281	31.60	3.213	34.66
Feb. 9.5	25.717	17.31	27.288	23.99	14.361	32.21	3.281	33.73
19.5	25.728	16.65	27.202	27.42	14.383	32.99	3.300	33.04
Mar. 1.4	25.692	16.19	27.052	30.56	14.351	33.86	3.272	32.55
11.4	25.617	15.93	26.844	33.35	14.269	34.79	3.203	32.26
21.4	25.509	15.81	26.590	35.72	14.149	35.70	3.103	32.13
31.3	25.379	15.84	26.300	37.64	14.001	36.56	2.977	32.15
Apr. 10.3	25.234	15.99	25.987	39.08	13.833	37.30	2.836	32.28
20.3	25.085	16.24	25.664	40.01	13.658	37.90	2.690	32.53
30.3	24.939	16.55	25.338	40.44	13.485	38.35	2.546	32.85
May 10.2	24.804	16.93	25.021	40.36	13.324	38.60	2.411	33.24
20.2	24.687	17.37	24.724	39.78	13.179	38.67	2.292	33.69
30.2	24.590	17.85	24.451	38.72	13.061	38.56	2.193	34.17
June 9.2	24.520	18.36	24.212	37.21	12.970	38.26	2.119	34.69
19.1	24.476	18.88	24.012	35.30	12.913	37.81	2.070	35.24
29.1	24.462	19.41	23.857	33.03	12.889	37.20	2.050	35.78
July 9.1	24.478	19.93	23.751	30.47	12.899	36.45	2.057	36.31
19.0	24.523	20.42	23.699	27.70	12.944	35.57	2.094	36.81
29.0	24.597	20.84	23.700	24.80	13.023	34.58	2.160	37.25
Aug. 8.0	24.698	21.17	23.759	21.87	13.136	33.47	2.254	37.60
18.0	24.828	21.39	23.875	19.00	13.280	32.25	2.375	37.81
27.9	24.986	21.45	24.049	16.31	13.457	30.96	2.523	37.89
Sept. 6.9	25.170	21.34	24.282	13.89	13.664	29.58	2.700	37.78
16.9	25.380	21.01	24.567	11.84	13.900	28.12	2.903	37.45
26.9	25.615	20.46	24.902	10.26	14.166	26.60	3.131	36.90
Oct. 6.8	25.874	19.66	25.280	9.22	14.457	25.04	3.386	36.10
16.8	26.155	18.64	25.693	8.78	14.774	23.47	3.662	35.06
26.8	26.453	17.38	26.133	8.97	15.111	21.93	3.958	33.79
Nov. 5.7	26.764	15.93	26.586	9.81	15.466	20.43	4.269	32.32
15.7	27.083	14.31	27.041	11.29	15.829	19.03	4.588	30.68
25.7	27.402	12.60	27.481	13.36	16.194	17.78	4.909	28.93
Dec. 5.7	27.711	10.83	27.896	15.96	16.550	16.72	5.223	27.12
15.6	28.004	9.06	28.270	19.02	16.890	15.88	5.519	25.32
25.6	28.269	7.37	28.589	22.43	17.200	15.32	5.790	23.57
35.6	28.499	5.80	28.847	26.08	17.472	15.04	6.028	21.96
Mean Place	22.940	26.95	24.502	14.47	11.090	40.50	0.503	43.81
Sec δ , Tan δ	1.007	+0.118	1.718	-1.397	1.165	+0.598	1.006	+0.110
$D\psi\alpha$, $D_{\omega}\alpha$	+0.06	+0.01	+0.03	-0.06	+0.07	+0.03	+0.06	0.00
$D\psi\delta$, $D_{\omega}\delta$	-0.3	+0.8	-0.3	+0.8	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♌ Ursa Majoris. Mag. 3.1		♊ Cancri. Mag. 4.3		♈ Carinae. Mag. 5.1		♋ Ursa Majoris. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 53	° ' " +48 21	h m 8 53	° ' " +12 10	h m 8 54	° ' " -58 54	h m 8 57	° ' " +47 28
Jan. 0.6	35.169	54.22	59.255	40.55	58.955	25.15	61.141	56.04
10.6	35.473 ³⁰⁴	55.04 ⁸²	59.478 ²²³	39.34 ¹²¹	59.203 ²⁴⁸	28.92 ³⁷⁷	61.446 ³⁰⁵	56.79 ⁷⁵
20.5	35.712 ²³⁹	56.19 ¹¹⁵	59.655 ¹⁷⁷	38.33 ¹⁰¹	59.369 ¹⁶⁶	32.80 ³⁸⁸	61.689 ²⁴³	57.86 ¹⁰⁷
30.5	35.880 ¹⁶⁸	57.59 ¹⁴⁰	59.783 ¹²⁸	37.55 ⁷⁸	59.451 ⁸²	36.68 ³⁸⁸	61.863 ¹⁷⁴	59.20 ¹³⁴
Feb. 9.5	35.973 ⁹³	59.19 ¹⁶⁰	59.858 ⁷⁵	36.98 ⁵⁷	59.448 ³	40.46 ³⁷⁸	61.963 ¹⁰⁰	60.75 ¹⁵⁵
19.5	35.994 ²¹	60.91 ¹⁷²	59.881 ²³	36.64 ³⁴	59.365 ⁸³	44.06 ³⁶⁰	61.991 ²⁸	62.44 ¹⁶⁰
Mar. 1.4	35.944 ⁵⁰	62.66 ¹⁷⁵	59.857 ²⁴	36.49 ¹⁵	59.206 ¹⁵⁹	47.39 ³³³	61.949 ⁴²	64.16 ¹⁷²
11.4	35.832 ¹¹²	64.34 ¹⁶⁸	59.791 ⁶⁶	36.49 ⁶	58.985 ²²¹	50.38 ²⁹⁹	61.846 ¹⁰³	65.86 ¹⁷⁰
21.4	35.668 ¹⁶⁴	65.90 ¹⁵⁸	59.692 ⁹⁹	36.63 ¹⁴	58.708 ²⁷⁷	52.97 ²⁵⁹	61.692 ¹⁵⁴	67.41 ¹⁵⁶
31.4	35.465 ²⁰³	67.25 ¹³⁵	59.566 ¹²⁶	36.88 ²⁵	58.391 ³¹⁷	55.12 ²¹⁵	61.498 ¹⁹⁴	68.78 ¹³⁷
Apr. 10.3	35.236 ²²⁹	68.33 ¹⁰⁸	59.426 ¹⁴⁰	37.18 ³⁰	58.044 ²⁴⁷	56.80 ¹⁶⁸	61.277 ²²¹	69.90 ¹¹²
20.3	34.994 ²⁴²	69.11 ⁷⁸	59.279 ¹⁴⁷	37.53 ³⁵	57.678 ³⁶⁶	57.98 ¹¹⁸	61.043 ²³⁴	70.72 ⁸²
30.3	34.752 ²⁴²	69.56 ⁴⁵	59.133 ¹⁴⁶	37.90 ³⁷	57.308 ³⁷⁰	58.65 ⁶⁷	60.807 ²³⁶	71.22 ⁵⁰
May 10.2	34.521 ²³¹	69.66 ¹⁰	58.996 ¹³⁷	38.28 ³⁸	56.942 ³⁶⁶	58.80 ¹⁵	60.582 ²²⁵	71.38 ¹⁶
20.2	34.313 ²⁰⁸	69.42 ²⁴	58.875 ¹²¹	38.66 ³⁸	56.591 ³⁵¹	58.42 ³⁸	60.378 ²⁰⁴	71.20 ¹⁸
30.2	34.134 ¹⁷⁹	68.84 ⁵⁸	58.774 ¹⁰¹	39.03 ³⁷	56.266 ³²⁵	57.55 ⁸⁷	60.202 ¹⁷⁶	70.70 ⁵⁰
June 9.2	33.990 ¹⁴⁴	67.96 ⁸³	58.699 ⁷⁵	39.37 ³⁴	55.974 ²⁹²	56.20 ¹³⁵	60.060 ¹⁴²	69.88 ⁸²
19.1	33.888 ¹⁰²	66.79 ¹¹⁷	58.649 ⁵⁰	39.68 ³¹	55.722 ²⁵²	54.41 ¹⁷⁹	59.957 ⁶⁰	68.77 ¹¹¹
29.1	33.830 ¹⁴	65.37 ¹⁴²	58.628 ²¹	39.96 ²⁸	55.517 ²⁰⁵	52.24 ²¹⁷	59.897 ⁶⁰	67.42 ¹³⁵
July 9.1	33.816 ¹⁶⁴	63.73 ¹⁶⁴	58.634 ⁶	40.18 ²²	55.365 ¹⁸²	49.74 ²⁵⁰	59.881 ¹⁶	65.83 ¹⁵⁹
19.1	33.849 ³³	61.91 ¹⁸²	58.671 ³⁷	40.35 ¹⁷	55.270 ⁹⁶	47.00 ²⁷⁴	59.909 ²⁸	64.07 ¹⁷⁶
29.0	33.927 ⁷⁸	59.95 ¹⁹⁶	58.737 ⁶⁶	40.44 ⁹	55.238 ³²	44.09 ²⁹¹	59.981 ⁷²	62.16 ¹⁹¹
Aug. 8.0	34.049 ¹²³	57.86 ²⁰⁹	58.831 ⁹⁴	40.43 ¹	55.268 ³⁰	41.11 ²⁹⁸	60.097 ¹¹⁶	60.12 ²⁰⁴
18.0	34.215 ¹⁶⁶	55.70 ²¹⁶	58.954 ¹²³	40.30 ¹³	55.365 ⁹⁷	38.17 ²⁹⁴	60.255 ¹⁵⁸	57.99 ²¹³
27.9	34.423 ²⁰⁸	53.50 ²²⁰	59.104 ¹⁵⁰	40.02 ²⁸	55.530 ¹⁶⁵	35.35 ²⁸²	60.455 ²⁰⁰	55.81 ²¹⁸
Sept. 6.9	34.672 ²⁴⁹	51.29 ²²¹	59.282 ¹⁷⁸	39.59 ⁴³	55.761 ²³¹	32.77 ²⁵⁸	60.696 ²⁴¹	53.61 ²²⁰
16.9	34.960 ²⁸⁸	49.10 ²¹⁹	59.487 ²⁰⁵	38.97 ⁶²	56.056 ²⁹⁵	30.54 ²²³	60.974 ²⁷⁸	51.42 ²¹⁹
26.9	35.283 ³²³	46.98 ²¹²	59.719 ²³²	38.16 ⁸¹	56.410 ³⁵⁴	28.75 ¹⁷⁹	61.290 ³¹⁶	49.29 ²¹³
Oct. 6.8	35.642 ³⁵⁹	44.95 ²⁰³	59.976 ²⁵⁷	37.16 ¹⁰⁰	56.816 ⁴⁰⁶	27.49 ¹²⁶	61.640 ³⁵⁰	47.24 ²⁰⁵
16.8	36.033 ³⁹¹	43.05 ¹⁹⁰	60.256 ²⁸⁰	35.96 ¹²⁰	57.265 ⁴⁴⁹	26.83 ⁶⁶	62.021 ³⁸¹	45.32 ¹⁹²
26.8	36.448 ⁴¹⁵	41.35 ¹⁷⁰	60.557 ³⁰¹	34.59 ¹³⁷	57.747 ⁴⁸²	26.78 ⁵	62.430 ⁴⁰⁹	43.57 ¹⁷⁵
Nov. 5.8	36.884 ⁴³⁶	39.87 ¹⁴⁸	60.872 ³¹⁵	33.08 ¹⁵¹	58.247 ⁵⁰⁰	27.39 ⁶¹	62.859 ⁴²⁹	42.05 ¹⁵²
15.7	37.333 ⁴⁴⁹	38.68 ¹¹⁹	61.197 ³²⁵	31.46 ¹⁶²	58.752 ⁵⁰⁵	28.67 ¹²⁸	63.301 ⁴⁴²	40.79 ¹²⁶
25.7	37.781 ⁴⁴⁸	37.80 ⁸⁸	61.525 ³⁶⁸	29.80 ¹⁶⁶	59.243 ⁴⁹¹	30.57 ¹⁹⁰	63.745 ⁴⁴⁴	39.83 ⁹⁶
Dec. 5.7	38.221 ⁴⁴⁰	37.27 ⁵³	61.846 ³²¹	28.14 ¹⁶⁶	59.710 ⁴⁶⁷	33.01 ²⁴⁴	64.182 ⁴³⁷	39.23 ⁶⁰
15.6	38.639 ⁴¹⁸	37.12 ¹⁵	62.150 ³⁰⁴	26.54 ¹⁶⁰	60.131 ⁴²¹	35.97 ²⁹⁶	64.598 ⁴¹⁶	39.00 ²³
25.6	39.021 ³⁸²	37.35 ²³	62.431 ²⁸¹	25.05 ¹⁴⁹	60.497 ³⁶⁶	39.31 ³⁸⁴	64.980 ³⁸²	39.16 ¹⁶
35.6	39.355 ³³⁴	37.96 ⁶¹	62.676 ²⁴⁵	23.72 ¹³³	60.790 ²⁹³	42.93 ³⁶²	65.315 ³³⁵	39.69 ⁵³
Mean Place	31.958	66.23	56.993	46.93	56.499	31.66	57.998	68.31
Sec δ, Tan δ	1.505	+1.125	1.023	+0.216	1.937	-1.658	1.480	+1.091
D _φ α, D _ω α	+0.08	+0.05	+0.07	+0.01	+0.03	-0.08	+0.08	+0.05
D _φ δ, D _ω δ	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ^2 Ursae Majoris. Mag. 4.9		κ Cancri. Mag. 5.1		λ Argus. Mag. 2.2		θ Hydræ. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 3	° ' " +67 27	h m 9 3	° ' " +10 59	h m 9 4	° ' " -43 5	h m 9 10	° ' " + 2 39
Jan. 0.6	11.57	67.01	17.436	63.93	58.647	45.37	4.965	49.51
10.6	12.05 48	68.67 166	17.666 230	62.60 133	58.877 230	48.90 353	5.193 228	47.71 180
20.6	12.43 38	70.70 203	17.851 185	61.50 110	59.049 172	52.49 359	5.378 185	46.10 161
30.5	12.69 26	72.99 229	17.986 135	60.62 88	59.159 110	56.03 354	5.515 137	44.68 142
Feb. 9.5	12.82 13	75.48 249	18.070 84	59.97 65	59.204 45	59.46 343	5.601 86	43.50 118
	2	256	38	43	14	323	36	96
19.5	12.84	78.04	18.103	59.54	59.190	62.69	5.637	42.54
Mar. 1.4	12.74 20	80.56 252	18.088 15	59.32 22	59.119 71	65.64 295	5.626 11	41.82 72
11.4	12.54 10	82.93 237	18.031 57	59.27 5	58.998 121	68.25 261	5.575 51	41.31 51
21.4	12.23 31	85.06 213	17.939 92	59.36 9	58.835 163	70.50 225	5.488 87	41.00 31
31.4	11.85 38	86.85 179	17.820 119	59.58 23	58.642 193	72.34 184	5.375 113	40.87 13
	48	139	135	29	216	141	129	3
Apr. 10.3	11.42	88.24	17.685	59.87	58.426	73.75	5.246	40.90
20.3	10.97 45	89.18 94	17.541 144	60.22 35	58.198 228	74.70 95	5.107 139	41.06 16
30.3	10.50 47	89.63 45	17.397 144	60.60 38	57.965 233	75.19 49	4.967 140	41.34 28
May 10.3	10.04 46	89.60 3	17.260 137	61.00 40	57.737 228	75.23 4	4.834 133	41.72 38
20.2	9.61 43	89.08 52	17.139 121	61.41 41	57.522 215	74.81 42	4.714 120	42.19 47
	38	99	104	40	198	86	105	54
30.2	9.23	88.09	17.035	61.81	57.324	73.95	4.609	42.73
June 9.2	8.91 32	86.67 142	16.955 80	62.20 39	57.151 173	72.68 127	4.525 84	43.32 59
19.1	8.65 26	84.86 181	16.899 56	62.56 36	57.005 146	71.04 164	4.466 59	43.96 64
29.1	8.46 19	82.70 216	16.871 28	62.89 33	56.892 113	69.06 198	4.432 34	44.62 66
July 9.1	8.35 11	80.27 243	16.870 1	63.17 28	56.814 78	66.82 224	4.423 9	45.29 67
	2	268	28	21	39	244	20	64
19.1	8.33	77.59	16.898	63.38	56.775	64.38	4.443	45.93
29.0	8.38 5	74.75 284	16.954 56	63.53 15	56.775 0	61.80 258	4.488 45	46.52 59
Aug. 8.0	8.53 15	71.80 295	17.039 85	63.57 4	56.818 43	59.18 263	4.562 74	47.03 51
18.0	8.74 21	68.79 301	17.152 113	63.49 8	56.906 88	56.62 266	4.663 101	47.42 39
28.0	9.04 30	65.78 301	17.292 140	63.25 24	57.038 132	54.19 243	4.793 130	47.64 22
	37	294	169	40	176	218	159	4
Sept. 6.9	9.41	62.84	17.461	62.85	57.214	52.01	4.952	47.68
16.9	9.85 44	60.00 284	17.657 196	62.27 58	57.434 220	50.16 185	5.137 185	47.49 19
26.9	10.36 51	57.34 266	17.881 224	61.48 79	57.696 262	48.73 143	5.351 214	47.05 44
Oct. 6.8	10.94 58	54.90 244	18.132 251	60.49 99	57.997 301	47.79 94	5.591 240	46.34 71
16.8	11.56 62	52.75 215	18.405 273	59.29 120	58.331 334	47.39 40	5.857 266	45.37 97
	66	183	295	138	361	19	288	126
26.8	12.22	50.92	18.700	57.91	58.692	47.58	6.145	44.12
Nov. 5.8	12.92 70	49.48 144	19.013 313	56.38 153	59.071 379	48.37 79	6.452 307	42.63 149
15.7	13.63 71	48.48 100	19.336 323	54.72 166	59.459 388	49.76 139	6.770 318	40.93 170
25.7	14.35 72	47.94 54	19.663 327	53.00 172	59.845 386	51.70 194	7.092 312	39.09 184
Dec. 5.7	15.06 71	47.89 5	19.986 323	51.27 173	60.218 373	54.13 243	7.410 318	37.14 195
	66	46	307	169	346	285	304	199
15.6	15.72	48.35	20.293	49.58	60.564	56.98	7.714	35.15
25.6	16.32 60	49.30 95	20.578 285	48.01 157	60.873 309	60.17 319	7.996 282	33.20 195
35.6	16.85 53	50.70 140	20.829 251	46.58 143	61.135 262	63.59 342	8.246 250	31.33 157
Mean Place	6.642	81.53	15.224	70.48	56.550	49.80	2.860	54.55
Sec δ , Tan δ	2.610	+2.411	1.019	+0.194	1.369	-0.936	1.001	+0.047
$D\psi a$, $D\omega a$	+0.11	+0.12	+0.06	+0.01	+0.04	-0.04	+0.06	0.00
$D\psi \delta$, $D\omega \delta$	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Argus. Mag. 1.8		δ Cancri. Mag. 6.6		ϵ Argus. Mag. 2.2		40 Lynceis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 12	° ' " -69 22	h m 9 14	° ' " +18 3	h m 9 14	° ' " -58 55	h m 9 16	° ' " +34 44
	s	"	s	"	s	"	s	"
Jan. 0.6	20.56	22.50	23.394	19.83	54.335	28.40	2.790	27.64
10.6	20.91 ³⁵	26.19 ³⁶⁰	23.641 ²⁴⁷	18.84 ⁹⁰	54.621 ²⁸⁶	32.08 ³⁶⁸	3.070 ²⁸⁰	27.56 ⁸
20.6	21.14 ²³	30.07 ³⁸⁸	23.843 ³⁰²	18.12 ⁷²	54.829 ³⁰⁸	35.93 ³⁸⁵	3.299 ²²⁹	27.82 ²⁶
30.5	21.26 ¹²	34.03 ⁵⁹⁶	23.995 ¹⁵²	17.64 ⁴⁸	54.952 ¹²³	39.82 ³⁸⁹	3.472 ¹⁷³	28.36 ⁵⁴
Feb. 9.5	21.27 ¹	37.97 ³⁹⁴	24.094 ⁹⁰	17.41 ²⁸	54.991 ³⁹	43.65 ³⁸³	3.584 ¹¹²	29.16 ⁸⁰
	11 ³⁸²		45 ⁴⁵	1 ¹	43 ⁴³	300 ³⁰⁰	50 ⁵⁰	90 ⁹⁰
19.5	21.16	41.79	24.139	17.40	54.948	47.34	3.634	30.15
Mar. 1.4	20.93 ²³	45.39 ³⁶⁰	24.134 ⁵	17.59 ¹⁹	54.891 ¹¹⁷	50.79 ³⁴⁵	3.627 ⁷	31.28 ¹¹³
11.4	20.62 ³¹	48.72 ³³³	24.086 ⁴⁸	17.92 ³³	54.646 ¹⁸⁵	53.94 ³¹⁵	3.567 ⁶⁰	32.49 ¹²¹
21.4	20.23 ³⁹	51.68 ²⁹⁶	23.999 ⁸⁷	18.35 ⁴⁸	54.408 ²⁴³	56.73 ²⁷⁹	3.463 ¹⁰⁴	33.67 ¹¹⁸
31.4	19.77 ⁴⁶	54.24 ²⁶⁶	23.883 ¹¹⁶	18.85 ⁵⁰	54.114 ²⁸⁹	59.10 ²³⁷	3.326 ¹³⁷	34.79 ¹¹²
	51 ²¹⁰		135 ¹³⁵	53 ⁵³	323 ³²³	192 ¹⁹²	163 ¹⁶³	101 ¹⁰¹
Apr. 10.3	19.26	56.34	23.748	19.38	53.791	61.02	3.163	35.80
20.3	18.71 ⁵⁸	57.94 ¹⁸⁰	23.602 ¹⁴⁶	19.90 ⁵²	53.444 ³⁴⁷	62.45 ¹⁴³	2.987 ¹⁷⁶	36.64 ⁸⁴
30.3	18.15 ⁵⁶	59.03 ¹⁰⁹	23.455 ¹⁴⁷	20.39 ⁴⁹	53.087 ³⁵⁷	63.37 ⁹²	2.807 ¹⁸⁰	37.27 ⁶⁸
May 10.3	17.58 ⁵⁷	59.59 ⁵⁶	23.314 ¹⁴¹	20.82 ⁴³	52.729 ³⁵⁸	63.76 ³⁹	2.633 ¹⁷⁴	37.69 ⁴²
20.2	17.02 ⁵⁶	59.60 ¹	23.185 ¹²⁹	21.19 ³⁷	52.382 ³⁴⁷	63.65 ¹¹	2.474 ¹⁵⁹	37.87 ¹⁸
	53 ⁵²		111 ¹¹¹	29 ²⁹	230 ²³⁰	62 ⁶²	140 ¹⁴⁰	4 ⁴
30.2	16.49	59.08	23.074	21.48	52.052	63.03	2.334	37.83
June 9.2	15.99 ⁵⁰	58.05 ¹⁰³	22.985 ⁸⁹	21.67 ¹⁹	51.750 ³⁰²	61.92 ¹¹¹	2.221 ¹¹³	37.54 ²⁹
19.1	15.54 ⁴⁵	56.54 ¹⁵¹	22.921 ⁶⁴	21.79 ¹²	51.483 ²⁶⁷	60.36 ¹⁵⁶	2.136 ⁸⁵	37.04 ⁵⁰
29.1	15.15 ³⁹	54.58 ¹⁹⁶	22.883 ³⁸	21.81 ²	51.258 ²²⁵	58.39 ¹⁹⁷	2.062 ⁵⁴	36.33 ⁷¹
July 9.1	14.84 ³¹	52.24 ²³⁴	22.874 ⁹	21.74 ⁷	51.061 ¹⁷⁷	56.07 ²³²	2.062 ²⁰	35.44 ⁸⁹
	23 ²⁸⁶		20 ²⁰	17 ¹⁷	123 ¹²³	263 ²⁶³	14 ¹⁴	107 ¹⁰⁷
19.1	14.61 ¹⁴	49.58 ²⁸⁸	22.894 ⁴⁷	21.57 ²⁹	50.958 ⁶⁵	53.45 ²⁸¹	2.076 ⁴⁸	34.37 ¹²⁴
29.0	14.47 ⁴	46.70 ³⁰⁴	22.941 ⁷⁷	21.28 ⁴⁰	50.893 ¹	50.64 ²⁸⁸	2.124 ⁸²	33.13 ¹³⁶
Aug. 8.0	14.43 ⁵	43.66 ³⁰⁷	23.018 ¹⁰⁶	20.88 ⁵²	50.892 ⁶⁴	47.71 ²⁹⁴	2.206 ¹¹⁶	31.77 ¹⁸⁰
18.0	14.48 ¹⁵	40.59 ²⁹⁹	23.124 ¹³³	20.36 ⁶⁸	50.956 ¹³²	44.77 ²⁸⁶	2.322 ¹⁵⁰	30.27 ¹⁶²
28.0	14.63 ²⁷	37.60 ²⁶²	23.257 ¹⁶⁴	19.68 ⁸²	51.088 ¹⁹⁹	41.91 ²⁶⁵	2.472 ¹⁸³	28.65 ¹⁷⁰
Sept. 6.9	14.90	34.78	23.421	18.86	51.287	39.26	2.655	26.95
16.9	15.26 ³⁸	32.25 ²⁵³	23.613 ¹⁹²	17.89 ⁹⁷	51.552 ²⁶⁵	36.91 ²³⁵	2.872 ²¹⁷	25.17 ¹⁷⁸
26.9	15.72 ⁴⁶	30.12 ²¹³	23.835 ²²²	16.74 ¹¹⁵	51.881 ³²⁹	34.96 ¹⁹⁵	3.121 ²⁴⁹	23.33 ¹⁸⁴
Oct. 6.8	16.26 ⁵⁴	28.47 ¹⁶⁵	24.085 ²⁵⁰	15.45 ¹²⁹	52.265 ³⁸⁴	33.50 ¹⁴⁶	3.401 ²⁸⁰	21.46 ¹⁸⁷
16.8	16.86 ⁶⁶	27.39 ¹⁰⁸	24.360 ²⁷⁵	14.01 ¹⁴⁴	52.700 ⁴³⁵	32.62 ⁸⁸	3.712 ³¹¹	19.60 ¹⁸⁶
	66 ⁴⁵		300 ³⁰⁰	155 ¹⁵⁵	472 ⁴⁷²	27 ²⁷	336 ³³⁶	182 ¹⁸²
26.8	17.52	26.94	24.660	12.46	53.172	32.35	4.048	17.78
Nov. 5.8	18.21 ⁶⁹	27.14 ²⁰	24.979 ³¹⁹	10.81 ¹⁶⁵	53.671 ⁴⁹⁹	32.72 ³⁷	4.406 ³⁵⁸	16.04 ¹⁷⁴
15.7	18.91 ⁷⁰	28.02 ⁸⁸	25.310 ³³¹	9.13 ¹⁶⁸	54.181 ⁵¹⁰	33.76 ¹⁰⁴	4.779 ³⁷³	14.45 ¹⁵⁹
25.7	19.60 ⁶⁹	29.55 ¹⁵³	25.648 ³³⁸	7.45 ¹⁶⁸	54.687 ⁵⁰⁶	35.42 ¹⁶⁶	5.160 ³⁸¹	13.04 ¹⁴¹
Dec. 5.7	20.26 ⁶⁶	31.69 ²¹⁴	25.983 ³²³	5.85 ¹⁵⁰	55.171 ⁴⁸⁴	37.67 ²²⁵	5.538 ³⁷⁸	11.87 ¹¹⁷
	59 ²⁶⁸		323 ³²³	150 ¹⁵⁰	448 ⁴⁴⁸	277 ²⁷⁷	364 ³⁶⁴	91 ⁹¹
15.7	20.85	34.37	26.306	4.35	55.619	40.44	5.902	10.96
25.6	21.37 ⁵²	37.52 ³¹⁵	26.606 ³⁰⁰	3.02 ¹³³	56.015 ³⁹⁶	43.64 ³²⁰	6.241 ³³⁹	10.38 ⁵⁸
35.6	21.79 ⁴²	41.04 ³⁵²	26.875 ²⁶⁹	1.91 ¹¹¹	56.349 ³³⁴	47.16 ³⁵²	6.544 ³⁰³	10.12 ²⁶
Mean Place	17.664	30.83	21.132	28.33	51.990	35.56	0.205	39.40
Sec δ , Tan δ	2.839	-2.657	1.052	+0.326	1.938	-1.660	1.217	+0.693
$D\psi a$, $D\omega a$	+0.01	-0.13	+0.07	+0.02	+0.03	-0.08	+0.07	+0.03
$D\psi \delta$, $D\omega \delta$	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7	-0.3	+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pyxid. Mag. 4.9		α Hydræ. Mag. 2.2		h Ursæ Majoris. Mag. 3.8		d Ursæ Majoris. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 17	° ' " -25 36	h m 9 23	° ' " - 8 17	h m 9 25	° ' " +63 24	h m 9 27	° ' " +70 11
	s	"	s	"	s	"	s	"
Jan. 0.6	50.847	42.28	32.533	56.32	4.30	76.11	15.32	29.16
10.6	51.078	45.29	32.769	58.65	4.76	77.40	15.90	30.71
20.6	51.261	48.30	32.960	60.87	5.14	79.10	16.36	32.67
30.5	51.392	51.23	33.103	62.93	5.42	81.13	16.71	34.97
Feb. 9.5	51.471	53.99	33.196	64.79	5.59	83.40	16.92	37.52
19.5	51.496	56.52	33.240	66.41	5.65	85.82	16.99	40.19
Mar. 1.5	51.472	58.80	33.238	67.79	5.62	88.28	16.93	42.87
11.4	51.405	60.77	33.193	68.89	5.49	90.66	16.74	45.44
21.4	51.303	62.43	33.113	69.75	5.28	92.86	16.45	47.82
31.4	51.171	63.73	33.006	70.35	5.00	94.81	16.06	49.88
Apr. 10.3	51.020	64.70	32.880	70.72	4.67	96.40	15.59	51.56
20.3	50.857	65.30	32.743	70.85	4.30	97.00	15.09	52.79
30.3	50.691	65.54	32.603	70.77	3.91	98.35	14.56	53.53
May 10.3	50.529	65.44	32.467	70.47	3.53	98.63	14.03	53.76
20.2	50.376	65.01	32.341	70.00	3.16	98.45	13.52	53.49
30.2	50.239	64.24	32.229	69.35	2.83	97.81	13.04	52.71
June 9.2	50.121	63.18	32.135	68.55	2.54	96.72	12.62	51.46
19.2	50.023	61.86	32.063	67.62	2.30	95.24	12.27	49.77
29.1	49.953	60.30	32.013	66.58	2.11	93.40	11.99	47.70
July 9.1	49.911	58.57	31.988	65.46	1.99	91.23	11.79	45.30
19.1	49.896	56.70	31.988	64.31	1.93	88.80	11.68	42.60
29.0	49.913	54.76	32.016	63.17	1.94	86.15	11.67	39.70
Aug. 8.0	49.960	52.81	32.071	62.07	2.03	83.34	11.74	36.63
18.0	50.042	50.94	32.154	61.07	2.18	80.43	11.90	33.46
28.0	50.157	49.23	32.267	60.23	2.39	77.46	12.15	30.26
Sept. 6.9	50.305	47.72	32.408	59.61	2.66	74.50	12.49	27.08
16.9	50.487	46.51	32.581	59.24	3.00	71.59	12.92	24.00
26.9	50.705	45.67	32.783	59.16	3.40	68.79	13.43	21.05
Oct. 6.9	50.953	45.26	33.014	59.42	3.86	66.17	14.01	18.30
16.8	51.231	45.30	33.273	60.04	4.37	63.76	14.66	15.84
26.8	51.535	45.83	33.556	61.00	4.93	61.65	15.37	13.70
Nov. 5.8	51.858	46.85	33.860	62.32	5.52	59.88	16.12	11.96
15.7	52.194	48.34	34.176	63.96	6.14	58.49	16.90	10.65
25.7	52.533	50.27	34.499	65.87	6.77	57.55	17.70	9.82
Dec. 5.7	52.866	52.57	34.819	68.01	7.39	57.10	18.49	9.51
15.7	53.183	55.19	35.126	70.28	7.99	57.13	19.25	9.74
25.6	53.473	58.02	35.413	72.64	8.55	57.67	19.96	10.50
35.6	53.727	60.99	35.668	74.99	9.05	58.68	20.59	11.76
Mean Place	48.883	43.41	30.551	53.44	0.187	92.34	10.177	46.05
Sec δ , Tan δ	1.109	-0.480	1.011	-0.146	2.235	+1.999	2.951	+2.776
$D\psi\alpha$, $D\omega\alpha$	+0.05	-0.02	+0.06	-0.01	+0.09	+0.10	+0.11	+0.15
$D\psi\delta$, $D\omega\delta$	-0.3	+0.7	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Ursa Majoris. Mag. 3.3			ϕ Argus. Mag. 3.6			ξ Leonis. Mag. 5.1			10 Leonis Minoris. Mag. 4.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 9 27	s +52 2	° ' "	h m 9 27	s -40 6	° ' "	h m 9 27	s +11 39	° ' "	h m 9 29	s +36 45	° ' "
Jan. 0.6	22.095	87.88	27.659	7.23	30.570	57.20	11.219	47.55	5			
10.6	22.454 ³⁵⁰	68.61 ⁷³	27.913 ²⁵⁴	10.61 ³⁸³	30.821 ²⁵¹	55.81 ¹³⁹	11.517 ²⁹⁸	47.50 ⁵				
20.6	22.750 ²⁹⁶	69.73 ¹¹²	28.112 ¹⁹⁰	14.09 ³⁴⁸	31.028 ²⁰⁷	54.67 ¹¹⁴	11.765 ²⁴⁸	47.80 ³⁰				
30.5	22.973 ²²⁸	71.18 ¹⁴⁵	28.253 ¹⁴¹	17.56 ³⁴⁷	31.187 ¹⁵⁰	53.76 ⁹¹	11.955 ¹⁹⁰	48.41 ⁶¹				
Feb. 9.5	23.119 ¹⁴⁶	72.91 ¹⁷³	28.334 ⁸¹	20.93 ³³⁷	31.295 ¹⁰⁸	53.10 ⁶⁶	12.085 ¹³⁰	49.29 ⁸⁸				
19.5	23.186 ⁶⁷	74.81 ¹⁹⁰	28.356 ²²	24.12 ³¹⁹	31.353 ⁵⁸	52.67 ⁴³	12.153 ⁶⁸	50.40 ¹¹¹				
Mar. 1.5	23.175 ¹¹	76.80 ¹⁹⁹	28.322 ⁸⁴	27.07 ²⁹⁵	31.361 ⁸	52.47 ²⁰	12.160 ⁷	51.65 ¹²⁵				
11.4	23.095 ⁸⁰	78.78 ¹⁹⁶	28.238 ³⁴	29.71 ²⁶⁴	31.325 ³⁶	52.46 ¹	12.113 ⁴⁷	52.98 ¹³³				
21.4	22.952 ¹⁴³	80.67 ¹⁸⁹	28.112 ¹²⁶	32.02 ²⁸¹	31.252 ⁷³	52.61 ¹⁵	12.019 ⁹⁴	54.31 ¹³³				
31.4	22.761 ¹⁹¹	82.36 ¹⁶⁹	27.953 ¹⁵⁹	33.93 ¹⁹¹	31.151 ¹⁰¹	52.88 ²⁷	11.887 ¹³²	55.58 ¹²⁷				
Apr. 10.3	22.532 ²²⁹	83.81 ¹⁴⁵	27.769 ¹⁸⁴	35.44 ¹⁵¹	31.028 ¹²³	53.24 ³⁶	11.727 ¹⁶⁰	56.71 ¹¹³				
20.3	22.280 ²⁶²	84.94 ¹¹³	27.570 ¹⁹⁰	36.53 ¹⁰⁹	30.893 ¹³⁵	53.65 ⁴¹	11.562 ¹⁷⁵	57.68 ⁹⁷				
30.3	22.018 ²⁶²	85.72 ⁷⁸	27.363 ²⁰⁷	37.18 ⁶⁵	30.754 ¹³⁹	54.09 ⁴⁴	11.370 ¹⁸²	58.43 ⁷⁵				
May 10.3	21.760 ²⁵⁸	86.12 ⁴⁰	27.156 ²⁰⁷	37.39 ²¹	30.619 ¹³⁵	54.55 ⁴⁶	11.191 ¹⁷⁹	58.94 ⁵¹				
20.2	21.514 ²⁴⁶	86.14 ²	26.956 ²⁰⁰	37.16 ²³	30.494 ¹²⁵	55.00 ⁴⁵	11.024 ¹⁶⁷	59.19 ²⁵				
30.2	21.292 ²²²	85.77 ³⁷	26.770 ¹⁸⁶	36.52 ⁶⁴	30.385 ¹⁰⁹	55.42 ⁴²	10.874 ¹⁵⁰	59.19 ⁰				
June 9.2	21.099 ¹⁹³	85.03 ⁷⁴	26.603 ¹⁶⁷	35.48 ¹⁰⁴	30.293 ⁹²	55.81 ³⁹	10.749 ¹²⁵	58.92 ²⁷				
19.2	20.945 ¹⁵⁴	83.94 ¹⁰⁹	26.458 ¹⁴⁵	34.06 ¹⁴²	30.225 ⁶⁸	56.17 ³⁶	10.651 ⁹⁶	58.42 ⁵⁰				
29.1	20.831 ¹¹⁴	82.54 ¹⁴⁰	26.341 ¹¹⁷	32.31 ¹⁷⁵	30.180 ⁴⁵	56.47 ³⁰	10.583 ⁶⁸	57.68 ⁷⁴				
July 9.1	20.761 ⁷⁰	80.85 ¹⁶⁹	26.255 ⁸⁶	30.28 ²⁰³	30.161 ¹⁹	56.70 ²³	10.549 ³⁴	56.72 ⁹⁶				
19.1	20.737 ²⁴	78.92 ¹⁹³	26.201 ⁵⁴	28.04 ²²⁴	30.167 ⁶	56.86 ¹⁶	10.547 ²	55.56 ¹¹⁶				
29.0	20.759 ²²	76.77 ²¹⁵	26.183 ¹⁸	25.64 ²⁴⁰	30.201 ³⁴	56.93 ⁷	10.579 ³²	54.23 ¹³³				
Aug. 8.0	20.829 ⁷⁰	74.47 ²³⁰	26.204 ²¹	23.18 ²⁴⁶	30.263 ⁶²	56.89 ⁴	10.646 ⁶⁷	52.73 ¹⁵⁰				
18.0	20.946 ¹¹⁷	72.03 ²⁴⁴	26.266 ⁶²	20.74 ²⁴⁴	30.351 ⁸⁸	56.71 ¹⁸	10.748 ¹⁰²	51.09 ¹⁶⁴				
28.0	21.109 ¹⁶³	69.50 ²⁵³	26.370 ¹⁰⁴	18.40 ²⁶⁴	30.468 ¹¹⁷	56.38 ³³	10.884 ¹³⁶	49.33 ¹⁷⁶				
Sept. 6.9	21.319 ²¹⁰	66.92 ²⁵⁸	26.516 ¹⁴⁶	16.27 ²¹³	30.613 ¹⁴⁵	55.89 ⁴⁹	11.056 ¹⁷²	47.47 ¹⁸⁶				
16.9	21.574 ²⁵⁵	64.35 ²³⁷	26.705 ¹⁸⁹	14.44 ¹⁸³	30.789 ¹⁷⁶	55.20 ⁶⁹	11.263 ²⁰⁷	45.52 ¹⁹⁵				
26.9	21.874 ³⁰⁰	61.82 ²⁵³	26.937 ²³²	12.98 ¹⁴⁶	30.994 ²⁰⁵	54.32 ⁸⁸	11.503 ²⁴⁰	43.52 ²⁰⁰				
Oct. 6.9	22.216 ³⁴²	59.37 ²⁴⁵	27.210 ²⁷³	11.98 ¹⁰⁰	31.227 ²³³	53.22 ¹¹⁰	11.778 ²⁷⁵	41.49 ²⁰³				
16.8	22.598 ³⁸²	57.06 ²³¹	27.519 ³⁰⁹	11.50 ⁴⁸	31.488 ²⁶¹	51.93 ¹²⁹	12.085 ³⁰⁷	39.48 ²⁰¹				
26.8	23.015 ⁴¹⁷	54.95 ²¹¹	27.857 ³³⁸	11.56 ⁶	31.773 ²⁸⁵	50.46 ¹⁴⁷	12.420 ³³⁵	37.52 ¹⁹⁶				
Nov. 5.8	23.460 ⁴⁴⁵	53.07 ¹⁸⁸	28.220 ³⁶³	12.21 ⁶⁵	32.080 ³⁰⁷	48.82 ¹⁶⁴	12.781 ³⁶¹	35.65 ¹⁸⁷				
15.7	23.927 ⁴⁶⁷	51.50 ¹⁵⁷	28.597 ³⁷⁷	13.43 ¹²²	32.402 ³²²	47.08 ¹⁷⁴	13.159 ³⁷⁸	33.95 ¹⁷⁰				
25.7	24.404 ⁴⁷⁷	50.29 ¹²¹	28.978 ³⁸¹	15.19 ¹⁷⁶	32.732 ³³⁰	45.27 ¹⁸¹	13.548 ³⁸⁹	32.45 ¹⁵⁰				
Dec. 5.7	24.880 ⁴⁷⁶	49.46 ⁸³	29.351 ³⁷³	17.45 ²²⁶	33.061 ³²⁹	43.45 ¹⁸²	13.936 ³⁵⁸	31.21 ¹²⁴				
15.7	25.342 ⁴⁶²	49.06 ⁴⁰	29.705 ³⁵⁴	20.14 ²⁶⁹	33.381 ³²⁰	41.69 ¹⁷⁶	14.314 ³⁷⁸	30.26 ⁹⁵				
25.6	25.773 ⁴³¹	49.10 ⁴	30.027 ³²²	23.17 ³⁰³	33.680 ²⁹⁹	40.06 ¹⁶⁴	14.668 ³⁵⁴	29.65 ⁶¹				
35.6	26.161 ³⁸⁸	49.55 ⁴⁵	30.310 ²⁸³	26.45 ³²⁸	33.949 ²⁶⁹	38.56 ¹⁴⁹	14.989 ³²¹	29.40 ²⁵				
Mean Place	18.915	83.10	25.682	11.48	28.447	64.89	8.652	60.55				
Sec δ , Tan δ	1.626	+1.282	1.307	-0.842	1.021	+0.206	1.248	+0.747				
$D\phi\alpha$, $D\alpha\alpha$	+0.08	+0.07	+0.05	-0.04	+0.06	+0.01	+0.07	+0.04				
$D\phi\delta$, $D\alpha\delta$	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	o Leonis. Mag. 3.8		θ Antise. Mag. 5.0		ε Leonis. Mag. 3.1		υ Argus. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 36	° ' " +10 15	h m 9 40	° ' " -27 23	h m 9 41	° ' " +24 8	h m 9 44	° ' " -64 41
Jan. 0.6	45.437 ²⁶⁶	66.53 ¹⁴⁰	31.957 ²⁵³	18.68 ³⁰⁸	10.823 ²⁷⁸	73.85 ⁷⁸	64.05 ³⁸	3.85 ³⁵³
10.6	45.693 ²¹⁴	65.04 ¹²⁵	32.210 ²⁰⁸	21.71 ³⁰⁶	11.101 ²⁸⁴	73.07 ⁵⁰	64.43 ²⁹	7.38 ³⁷⁷
20.6	45.907 ¹⁶⁶	63.79 ¹⁰²	32.418 ¹⁵⁷	24.76 ³⁰¹	11.335 ¹⁸⁶	72.57 ¹⁸	64.72 ²¹	11.15 ³⁹¹
30.5	46.073 ¹¹⁷	62.77 ⁷⁶	32.575 ¹⁰³	27.77 ²⁸⁸	11.521 ¹³¹	72.39 ⁹	64.93 ¹	15.06 ³⁹⁴
Feb. 9.5	46.190 ⁶⁶	62.01 ⁵³	32.678 ⁵¹	30.65 ²⁸⁷	11.652 ⁷⁶	72.48 ⁸⁴	65.03 ¹	19.00 ³⁸⁷
19.5	46.256 ¹⁷	61.48 ²⁸	32.729 ¹	33.32 ²⁴⁴	11.728 ²⁸	72.82 ⁵⁴	65.04 ⁹	22.87 ³⁷²
Mar. 1.5	46.273 ²⁷	61.20 ⁹	32.730 ⁴⁵	35.76 ²¹⁴	11.751 ²⁶	73.36 ⁷¹	64.95 ¹⁶	26.59 ³⁴⁷
11.4	46.246 ⁶⁵	61.11 ⁸	32.685 ⁸⁴	37.90 ¹⁸⁴	11.725 ⁶⁷	74.07 ⁷⁹	64.79 ²⁴	30.06 ³¹⁷
21.4	46.181 ⁹⁴	61.19 ²²	32.601 ¹¹⁵	39.74 ¹⁵⁰	11.658 ¹⁰¹	74.86 ⁸⁴	64.55 ³¹	33.23 ²⁸¹
31.4	46.087 ¹¹⁷	61.41 ³²	32.486 ¹³⁷	41.24 ¹¹⁵	11.557 ¹²⁶	75.70 ⁸³	64.24 ³⁵	36.04 ²³⁸
Apr. 10.4	45.970 ¹²⁹	61.73 ⁴⁰	32.349 ¹⁵²	42.39 ⁷⁹	11.431 ¹⁴¹	76.53 ⁷⁸	63.89 ³⁹	38.42 ¹⁹²
20.3	45.841 ¹³⁵	62.13 ⁴⁴	32.197 ¹⁵⁹	43.18 ⁴⁵	11.290 ¹⁴⁸	77.31 ⁶⁸	63.50 ⁴¹	40.34 ¹⁴³
30.3	45.706 ¹³³	62.57 ⁴⁷	32.038 ¹⁶⁰	43.63 ⁸	11.142 ¹⁴⁷	77.99 ⁵⁸	63.09 ⁴³	41.77 ⁹²
May 10.3	45.573 ¹²⁵	63.04 ⁴⁷	31.878 ¹⁵⁵	43.71 ²⁶	10.995 ¹³⁹	78.57 ⁴⁴	62.66 ⁴³	42.69 ³⁹
20.2	45.448 ¹¹⁰	63.51 ⁴⁶	31.723 ¹⁴⁴	43.45 ⁶⁰	10.856 ¹²⁴	79.01 ²⁸	62.23 ⁴²	43.08 ¹⁵
30.2	45.338 ⁹⁴	63.97 ⁴³	31.579 ¹²⁸	42.85 ⁹¹	10.732 ¹⁰⁷	79.29 ¹⁴	61.81 ⁴⁰	42.93 ⁶⁶
June 9.2	45.244 ⁷²	64.40 ⁴¹	31.451 ¹⁰⁹	41.94 ¹²⁰	10.625 ⁸⁵	79.43 ¹	61.41 ³⁶	42.27 ¹¹⁷
19.2	45.172 ⁵¹	64.81 ³⁵	31.342 ⁸⁸	40.74 ¹⁴⁵	10.540 ⁵⁹	79.42 ¹⁸	61.05 ³³	41.10 ¹⁶³
29.1	45.121 ²⁶	65.16 ³⁰	31.254 ⁶²	39.29 ¹⁶⁷	10.481 ³³	79.24 ³³	60.72 ²⁸	39.47 ²⁰⁴
July 9.1	45.095 ²	65.46 ²²	31.192 ³⁵	37.62 ¹⁸²	10.448 ⁷	78.91 ⁴⁸	60.44 ²²	37.43 ²³⁹
19.1	45.093 ²⁵	65.68 ¹⁵	31.157 ⁸	35.80 ¹⁹²	10.441 ²²	78.43 ⁶⁴	60.22 ¹⁶	35.04 ²⁶⁹
29.1	45.118 ⁵¹	65.83 ³	31.149 ²⁴	33.88 ¹⁹⁶	10.463 ⁵⁰	77.79 ⁷⁸	60.06 ⁸	32.35 ²⁸⁷
Aug. 8.0	45.169 ⁷⁹	65.86 ¹¹	31.173 ⁵⁷	31.92 ¹⁹²	10.513 ⁸¹	77.01 ⁹³	59.98 ⁰	29.48 ²⁹⁷
18.0	45.248 ¹⁰⁶	65.75 ²⁶	31.230 ⁹⁰	30.00 ¹⁸⁰	10.594 ¹¹¹	76.08 ¹⁰⁹	59.98 ⁸	26.51 ²⁹⁷
28.0	45.356 ¹³⁵	65.49 ⁴³	31.320 ¹²⁷	28.20 ¹⁶⁰	10.705 ¹⁴¹	74.99 ¹²⁴	60.06 ¹⁶	23.54 ²⁸⁶
Sept. 6.9	45.491 ¹⁶⁶	65.06 ⁶⁴	31.447 ¹⁶³	26.60 ¹³⁴	10.846 ¹⁷³	73.75 ¹³⁸	60.22 ²⁵	20.68 ²⁶³
16.9	45.657 ¹⁹⁵	64.42 ⁸⁴	31.610 ²⁰⁰	25.26 ⁹⁹	11.019 ²⁰⁵	72.37 ¹⁵³	60.47 ³³	18.05 ²²⁹
26.9	45.852 ²²⁵	63.58 ¹⁰⁵	31.810 ²³⁴	24.27 ⁵⁹	11.224 ²³⁶	70.84 ¹⁶⁴	60.80 ⁴¹	15.76 ¹⁸⁶
Oct. 6.9	46.077 ²⁵⁵	62.53 ¹²⁸	32.044 ²⁶⁹	23.68 ¹⁴	11.460 ²⁶⁷	69.20 ¹⁷⁵	61.21 ⁴⁸	13.90 ¹³⁴
16.8	46.332 ²⁷⁹	61.25 ¹⁴⁶	32.313 ²⁹⁸	23.54 ³⁶	11.727 ²⁹⁶	67.45 ¹⁸¹	61.69 ⁵⁴	12.56 ⁷⁵
26.8	46.611 ³⁰²	59.79 ¹⁶⁵	32.611 ³²¹	23.90 ⁸⁵	12.023 ³¹⁹	65.64 ¹⁸⁵	62.23 ⁵⁷	11.81 ¹²
Nov. 5.8	46.913 ³¹⁹	58.14 ¹⁷⁶	32.932 ³³⁹	24.75 ¹³³	12.342 ³³⁸	63.79 ¹⁸⁴	62.80 ⁶⁰	11.69 ⁵⁵
15.8	47.232 ³²⁹	56.38 ¹⁸⁵	33.271 ³⁴⁶	26.08 ¹⁷⁹	12.680 ³⁵¹	61.95 ¹⁷⁶	63.40 ⁶¹	12.24 ¹²⁰
25.7	47.561 ³³⁰	54.53 ¹⁸⁷	33.617 ³⁴⁵	27.87 ²²⁰	13.031 ³⁵¹	60.19 ¹⁶⁴	64.01 ⁵⁹	13.44 ¹⁸³
Dec. 5.7	47.891 ³²¹	52.66 ¹⁸⁴	33.962 ³³³	30.07 ²⁵³	13.382 ³⁴⁵	58.55 ¹⁴⁵	64.60 ⁵⁶	15.27 ²⁴¹
15.7	48.212 ³⁰²	50.82 ¹⁷⁴	34.295 ³⁰⁹	32.60 ²⁷⁹	13.727 ³²⁷	57.10 ¹²⁸	65.16 ⁵⁰	17.68 ²⁹⁰
25.6	48.514 ²⁷⁴	49.08 ¹⁵⁸	34.604 ²⁷⁶	35.39 ²⁹⁵	14.054 ²⁹⁷	55.87 ⁹⁵	65.66 ⁴²	20.53 ³³⁰
35.6	48.788	47.50	34.880	38.34	14.351	54.92	66.08	23.88
Mean Place	43.370	74.25	30.080	20.26	8.593	85.02	61.689	12.71
Sec δ, Tan δ	1.016	+0.181	1.126	-0.518	1.096	+0.448	2.339	-2.115
Dψ α, Dω α	+0.06	+0.01	+0.05	-0.03	+0.07	+0.02	+0.03	-0.12
Dψ δ, Dω δ	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6	-0.3	+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	U Ursae Majoris. Mag. 3.9			6 Sextantis. Mag. 6.0			μ Leonis. Mag. 4.1			Groombridge 1586. Mag. 6.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	9 45		+59 25	9 47		- 3 51	9 48		+26 23	9 50		+73 15
Jan. 0.6	9.550		30.01	5.048		18.04	4.987		42.48	65.06		70.64
10.6	9.989	439	30.93 92	5.302	254	20.20 216	5.274	267	41.77 71	65.77	71	72.06 141
20.6	10.357	968	32.29 136	5.516	214	22.24 204	5.517	243	41.37 8	66.36	59	73.93 188
30.6	10.643	286	34.02 178	5.685	169	24.10 186	5.711	194	41.29 4	66.82	48	76.20 227
Feb. 9.5	10.839	196	36.06 204	5.806	103	25.73 163	5.850	139	41.50 21	67.13	31	78.77 267
		102	223		70	141		85			14	275
19.5	10.941		38.29	5.875		27.14	5.935		41.96	67.27		81.52
Mar. 1.5	10.952	11	40.63 234	5.898	23	28.29 115	5.966	31	42.64 68	67.27	0	84.33 281
		75	234		20	92		19			16	276
11.4	10.877		42.97 222	5.878		29.21 92	5.947		43.46 92	67.11	30	87.09 258
21.4	10.723	154	45.19 202	5.821	57	29.87 66	5.883	64	44.38 96	66.81	41	89.67 281
31.4	10.506	217	47.21 174	5.735	86	30.31 22	5.785	98	45.34 94	66.40	51	91.98 196
Apr. 10.4	10.238		48.95	5.627		30.53	5.660		46.28	65.89		93.93
20.3	9.935	303	50.35 140	5.504	123	30.57 4	5.518	142	47.14 86	65.32	57	95.43 150
30.3	9.613	322	51.33 96	5.375	129	30.44 13	5.368	150	47.90 76	64.70	62	96.45 102
May 10.3	9.287	336	51.89 56	5.246	129	30.14 30	5.218	150	48.53 63	64.06	64	96.96 51
20.2	8.970	317	52.00 11	5.123	123	29.70 44	5.074	144	49.00 47	63.43	63	96.92 4
		295	34		111	56		131			60	57
30.2	8.675		51.66	5.012		29.14	4.943		49.28	62.83		96.35
June 9.2	8.411	264	50.90 76	4.914	98	28.46 68	4.831	112	49.40 12	62.28	55	95.23 107
19.2	8.185	226	49.72 118	4.835	79	27.69 77	4.739	92	49.34 6	61.79	49	93.74 154
29.1	8.005	180	48.16 156	4.775	60	26.85 84	4.672	67	49.09 25	61.38	41	91.76 196
July 9.1	7.876	129	46.27 189	4.737	38	25.98 87	4.630	42	48.68 41	61.06	32	89.42 234
		77	218		14	89		14			22	269
19.1	7.799		44.09	4.723		25.09	4.616		48.09	60.84		86.73
29.1	7.778	21	41.65 244	4.733	10	24.22 87	4.631	15	47.33 76	60.72	12	83.77 296
Aug. 8.0	7.814	36	39.02 263	4.769	36	23.41 81	4.674	43	46.41 92	60.71	1	80.62 315
18.0	7.908	94	36.24 278	4.832	63	22.72 69	4.748	74	45.34 107	60.80	9	77.33 329
28.0	8.060	152	33.35 289	4.922	90	22.16 56	4.852	104	44.10 124	61.00	20	73.95 338
		209	293		121	87		135			31	338
Sept. 6.9	8.269		30.42	5.043		21.79	4.987		42.72	61.31		70.57
16.9	8.535	266	27.49 293	5.195	152	21.67 12	5.156	199	41.20 152	61.71	40	67.24 333
26.9	8.857	322	24.61 288	5.377	182	21.82 15	5.357	201	39.54 166	62.22	51	64.03 321
Oct. 6.9	9.233	376	21.85 276	5.591	214	22.25 43	5.590	233	37.77 177	62.82	60	61.01 302
16.8	9.659	426	19.27 258	5.835	244	23.01 76	5.855	265	35.92 185	63.52	70	58.24 277
		471	236		271	108		296			77	244
26.8	10.130		16.91	6.106		24.09	6.150		34.01	64.29		55.80
Nov. 5.8	10.640	510	14.86 205	6.402	296	25.47 138	6.470	320	32.09 192	65.12	83	53.75 205
15.8	11.180	540	13.15 171	6.715	313	27.14 167	6.811	341	30.21 188	66.00	93	52.14 161
25.7	11.736	556	11.84 131	7.038	323	29.03 189	7.165	354	28.42 179	66.91	91	51.02 112
Dec. 5.7	12.296	560	11.00 84	7.364	326	31.11 208	7.522	357	26.78 164	67.82	89	50.44 58
		546	35		318	218		351			89	0
15.7	12.842		10.65	7.682		33.29	7.873		25.34	68.71		50.44
25.6	13.361	519	10.78 13	7.982	300	35.51 222	8.207	334	24.16 118	69.56	85	50.99 55
35.6	13.831	470	11.41 63	8.255	273	37.72 221	8.513	366	23.26 90	70.31	75	52.09 110
Mean Place	6.034		47.52	3.136		13.59	2.755		54.51	59.596		89.75
Sec δ, Tan δ	1.966		+1.693	1.002		-0.067	1.116		+0.496	3.474		+3.327
D _ψ α, D _ω α	+0.09		+0.09	+0.06		0.00	+0.07		+0.03	+0.11		+0.19
D _ψ δ, D _ω δ	-0.3		+0.6	-0.3		+0.5	-0.3		+0.5	-0.3		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	19 Leonis Minoris. Mag. 5.2		ϕ Argus. Mag. 3.7		π Leonis. Mag. 4.9		γ Leonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s 52	° ' " +41 26	h m s 53	° ' " -54 10	h m s 55	° ' " + 8 26	h m s 2	° ' " +17 9
Jan. 0.6	38.951	50.28	58.764	13.67	51.682	26.75	50.516	54.05
10.6	39.284 ³³³	50.27 ¹	59.093 ³²⁹	17.12 ³⁴⁵	51.951 ²⁶⁹	25.12 ¹⁶³	50.799 ²⁸³	52.81 ¹²⁴
20.6	39.567 ²⁸³	50.67 ⁴⁰	59.357 ²⁶⁴	20.78 ³⁶⁶	52.180 ²²⁹	23.70 ¹⁴²	51.042 ²⁴³	51.83 ⁹⁸
30.6	39.794 ²²⁷	51.44 ⁷⁷	59.551 ¹⁹⁴	24.55 ³⁷⁷	52.363 ¹⁸⁸	22.53 ¹¹⁷	51.239 ¹⁹⁷	51.15 ⁶⁵
Feb. 9.5	39.958 ¹⁶⁴	52.54 ¹¹⁰	59.672 ¹²¹	28.33 ³⁷⁸	52.498 ¹³⁵	21.61 ⁹²	51.386 ¹⁴⁷	50.74 ⁴¹
	97	133	46	369	82	65	96	12
19.5	40.055	53.87	59.718	32.02	52.580	20.96	51.482	50.62
Mar. 1.5	40.090 ³⁵	55.38 ¹⁶¹	59.697 ²¹	35.53 ³⁵¹	52.618 ³⁸	20.53 ⁴³	51.526 ⁴⁴	50.73 ¹¹
11.4	40.065 ²⁵	56.99 ¹⁶¹	59.611 ⁸⁶	38.80 ³²⁷	52.609 ⁹	20.34 ¹⁹	51.524 ²	51.06 ³³
21.4	39.986 ⁷⁹	58.62 ¹⁶³	59.467 ¹⁴⁴	41.76 ²⁹⁶	52.562 ⁴⁷	20.34 ⁰	51.481 ⁴³	51.54 ⁴⁸
31.4	39.864 ¹²²	60.18 ¹⁵⁶	59.278 ¹⁸⁹	44.36 ²⁶⁰	52.483 ⁷⁹	20.49 ¹⁵	51.404 ⁷⁷	52.12 ³⁸
	156	143	226	220	108	29	104	65
Apr. 10.4	39.708	61.61	59.052	46.56	52.380	20.78	51.300	52.77
20.3	39.529 ¹⁷⁹	62.83 ¹²²	58.796 ²⁵⁶	48.30 ¹⁷⁴	52.261 ¹¹⁹	21.15 ³⁷	51.179 ¹²¹	53.44 ⁶⁷
30.3	39.338 ¹⁹¹	63.82 ⁹⁹	58.522 ²⁷⁴	49.57 ¹²⁷	52.135 ¹²⁶	21.59 ⁴⁴	51.049 ¹³⁰	54.10 ⁶⁶
May 10.3	39.145 ¹⁹³	64.52 ⁷⁰	58.240 ²⁸²	50.36 ⁷⁹	52.007 ¹²⁸	22.07 ⁴⁸	50.916 ¹³³	54.71 ⁶¹
20.3	38.957 ¹⁸⁸	64.93 ⁴¹	57.957 ²⁸³	50.66 ³⁰	51.885 ¹²²	22.57 ⁵⁰	50.788 ¹²⁸	55.26 ⁵⁵
	175	10	276	21	112	50	118	47
30.2	38.782	65.03	57.681	50.45	51.773	23.07	50.670	55.73
June 9.2	38.630 ¹⁵²	64.80 ²³	57.420 ²⁶¹	49.77 ⁶⁸	51.675 ⁹⁸	23.56 ⁴⁹	50.565 ¹⁰⁵	56.09 ³⁶
19.2	38.503 ¹²⁷	64.29 ⁵¹	57.180 ²⁴⁰	48.62 ¹¹⁵	51.594 ⁶¹	24.03 ⁴⁷	50.476 ⁸⁹	56.34 ²⁵
29.1	38.403 ¹⁰⁰	63.47 ⁸²	56.969 ²¹¹	47.06 ¹⁵⁶	51.533 ⁶¹	24.46 ⁴³	50.409 ⁶⁷	56.48 ¹⁴
July 9.1	38.336 ⁶⁷	62.39 ¹⁰⁸	56.790 ¹⁷⁹	45.09 ¹⁹⁷	51.493 ⁴⁰	24.84 ³⁸	50.362 ⁴⁷	56.50 ²
	34	131	138	226	17	31	22	10
19.1	38.302	61.08	56.652	42.83	51.476	25.15	50.340	56.40
29.1	38.301 ¹	59.51 ¹⁶⁷	56.559 ⁹³	40.28 ²⁶⁵	51.483 ⁷	25.37 ²²	50.342 ²	56.15 ²⁵
Aug. 8.0	38.338 ³⁷	57.76 ¹⁷⁵	56.514 ⁴⁵	37.59 ²⁶⁹	51.517 ⁸⁴	25.48 ¹¹	50.370 ²⁸	55.76 ³⁹
18.0	38.412 ⁷⁴	55.85 ¹⁹¹	56.524 ¹⁰	34.81 ²⁷⁸	51.576 ⁵⁹	25.46 ²	50.424 ⁵⁴	55.22 ⁵⁴
28.0	38.523 ¹¹¹	53.77 ²⁰⁸	56.591 ⁶⁷	32.05 ²⁷⁶	51.663 ⁸⁷	25.27 ¹⁹	50.508 ⁸⁴	54.50 ⁷²
	148	218	126	263	116	36	114	88
Sept. 7.0	38.671	51.59	56.717	29.42	51.779	24.91	50.622	53.62
16.9	38.858 ¹⁸⁷	49.32 ²²⁷	56.906 ¹⁸⁹	27.01 ²⁴¹	51.925 ¹⁴⁶	24.35 ⁵⁶	50.766 ¹⁴⁴	52.55 ¹⁰⁷
26.9	39.084 ²²⁶	46.99 ²³³	57.154 ²⁴⁸	24.93 ²⁰⁸	52.102 ¹⁷⁷	23.55 ⁸⁰	50.943 ¹⁷⁷	51.29 ¹²⁸
Oct. 6.9	39.349 ²⁶⁵	44.65 ²³⁴	57.460 ³⁰⁶	23.29 ¹⁶⁴	52.312 ²¹⁰	22.53 ¹⁰²	51.151 ²⁰⁸	49.86 ¹⁴³
16.8	39.650 ³⁰¹	42.34 ²³¹	57.819 ³⁵⁹	22.14 ¹¹⁵	52.551 ²³⁹	21.29 ¹²⁴	51.392 ²⁴¹	48.25 ¹⁶¹
	335	223	403	58	270	146	273	174
26.8	39.985	40.11	58.222	21.56	52.821	19.83	51.665	46.51
Nov. 5.8	40.351 ³⁶⁶	38.01 ²¹⁰	58.661 ⁴³⁹	21.60 ⁴	53.115 ²⁹⁴	18.17 ¹⁶⁶	51.964 ²⁹⁹	44.66 ¹⁸⁶
15.8	40.742 ³⁹¹	36.10 ¹⁹¹	59.123 ⁴⁶²	22.26 ⁶⁶	53.429 ³¹⁴	16.37 ¹⁸⁰	52.284 ³²⁰	42.75 ¹⁹¹
25.7	41.147 ⁴⁰⁵	34.44 ¹⁶⁶	59.596 ⁴⁷³	23.56 ¹³⁰	53.756 ³²⁷	14.46 ¹⁹¹	52.619 ³³⁵	40.82 ¹⁹³
Dec. 5.7	41.557 ⁴¹⁰	33.06 ¹³⁸	60.063 ⁴⁶⁷	25.45 ¹⁸⁹	54.087 ³³¹	12.50 ¹⁹⁶	52.960 ³⁴¹	38.94 ¹²⁸
	404	102	447	243	327	195	338	178
15.7	41.961	32.04	60.510	27.88	54.414	10.55	53.298	37.16
25.7	42.346 ³⁸⁵	31.41 ⁶³	60.921 ⁴¹¹	30.77 ²⁸⁹	54.724 ³¹⁰	8.69 ¹⁸⁶	53.623 ³²⁵	35.56 ¹⁶⁰
35.6	42.701 ³⁵⁵	31.18 ²³	61.284 ³⁶³	34.02 ³²⁵	55.010 ²⁸⁶	6.95 ¹⁷⁴	53.922 ²⁹⁹	34.17 ¹³⁹
Mean Place	36.398	65.64	56.760	21.11	49.720	34.70	48.496	64.54
Sec δ , Tan δ	1.334	+0.883	1.708	-1.385	1.011	+0.148	1.047	+0.309
$D\phi\alpha$, $D_m\alpha$	+0.07	+0.05	+0.04	-0.08	+0.06	+0.01	+0.06	+0.02
$D\phi\delta$, $D_m\delta$	-0.3	+0.5	-0.3	+0.5	-0.3	+0.5	-0.3	+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. (Regulus.) Mag. 1.3			λ Hydre. Mag. 3.8			γ Velorum. Mag. 4.1			32 Ursæ Majoris. Mag. 5.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 10 3	s	° ' "	h m 10 6	s	° ' "	h m 10 11	s	° ' "	h m 10 12	s	° ' "
			+12 21			-11 56			-41 42			+65 30
Jan. 0.6	59.188		74.71	34.292		38.47	16.664		32.10	5.19		62.69
10.6	59.461	278	73.23	34.559	267	40.96	16.971	307	35.32	5.75	56	63.57
20.6	59.699	238	72.00	34.788	229	43.39	17.228	257	38.70	6.23	48	64.96
30.6	59.892	193	71.03	34.973	185	45.70	17.429	201	42.16	6.61	38	66.78
Feb. 9.5	60.037	145	70.34	35.109	136	47.82	17.571	142	45.59	6.90	29	68.96
		93			87			84			16	
19.5	60.130		69.91	35.196		49.73	17.655		48.92	7.06		71.39
Mar. 1.5	60.174	44	69.73	35.235	39	51.39	17.681	26	52.06	7.12	6	73.99
11.5	60.174	0	69.77	35.232	3	52.80	17.654	27	54.97	7.08	4	76.61
21.4	60.133	41	69.99	35.189	43	53.93	17.580	74	57.57	6.94	14	79.14
31.4	60.058	75	70.35	35.115	74	54.81	17.466	114	59.85	6.71	23	81.50
		99			98			144			30	
Apr. 10.4	59.959		70.80	35.017		55.42	17.322		61.75	6.41		83.57
20.3	59.842	117	71.32	34.901	116	55.79	17.153	169	63.25	6.04	37	85.29
30.3	59.717	125	71.87	34.777	124	55.91	16.969	184	64.84	5.65	39	86.59
May 10.3	59.589	128	72.43	34.649	128	55.81	16.776	193	65.00	5.24	41	87.43
20.3	59.464	125	72.96	34.523	126	55.49	16.582	194	65.23	4.83	41	87.79
		114			117			190			40	
30.2	59.350		73.46	34.406		54.98	16.392		65.03	4.43		87.66
June 9.2	59.247	103	73.90	34.298	108	54.28	16.211	181	64.42	4.06	37	87.03
19.2	59.161	86	74.28	34.205	93	53.43	16.045	166	63.40	3.72	34	85.94
29.2	59.095	66	74.59	34.130	75	52.44	15.897	148	62.02	3.44	28	84.42
July 9.1	59.049	46	74.81	34.073	57	51.34	15.774	123	60.31	3.22	22	82.56
		23			36			97			18	
19.1	59.026		74.93	34.037		50.17	15.677		58.33	3.04		80.22
29.1	59.026	0	74.94	34.026	11	48.97	15.613	64	56.13	2.93	11	77.63
Aug. 8.0	59.052	26	74.83	34.039	13	47.80	15.583	30	53.79	2.89	4	74.81
18.0	59.103	51	74.56	34.079	40	46.69	15.592	9	51.40	2.92	3	71.78
28.0	59.184	81	74.13	34.148	69	45.70	15.643	51	49.03	3.04	12	68.62
		110			100			96			17	
Sept. 7.0	59.294		73.53	34.248		44.90	15.739		46.78	3.21		65.35
16.9	59.433	139	72.72	34.381	133	44.32	15.881	142	44.76	3.46	25	62.12
26.9	59.605	172	71.72	34.547	166	44.04	16.071	190	43.04	3.78	32	58.90
Oct. 6.9	59.810	205	70.50	34.748	201	44.07	16.308	237	41.71	4.17	39	55.81
16.9	60.045	235	69.08	34.980	232	44.47	16.588	280	40.85	4.63	46	52.88
		267			265			321			51	
26.8	60.312		67.47	35.245		45.25	16.909		40.50	5.14		50.20
Nov. 5.8	60.605	293	65.72	35.536	291	46.39	17.264	355	40.71	5.72	58	47.82
15.8	60.920	316	63.85	35.849	313	47.89	17.644	380	41.50	6.34	62	45.83
25.7	61.249	329	61.91	36.175	326	49.71	18.038	394	42.84	6.99	65	44.29
Dec. 5.7	61.584	335	59.97	36.506	331	51.80	18.435	397	44.71	7.65	66	43.23
		332			326			387			65	
15.7	61.916		58.08	36.832		54.09	18.822		47.06	8.30		42.70
25.7	62.234	318	56.31	37.143	311	56.51	19.186	364	49.81	8.93	68	42.73
35.6	62.527	293	54.72	37.429	286	58.99	19.517	331	52.88	9.52	59	43.30
Mean Place	57.221		83.99	32.504		35.89	14.886		37.28	1.438		82.84
Sec δ , Tan δ	1.024		+0.219	1.022		-0.212	1.340		-0.891	2.413		+2.196
$D\psi\alpha$, $D_{\alpha}\alpha$	+0.06		+0.01	+0.06		-0.01	+0.05		-0.05	+0.09		+0.13
$D\psi\delta$, $D_{\delta}\delta$	-0.3		+0.5	-0.3		+0.5	-0.4		+0.5	-0.4		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Leonis. Mag. 3.6		λ Ursae Majoris. Mag. 3.5		γ Leonis <i>pr.</i> Mag. 2.6		μ Ursae Majoris. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s	° ' " +23 49	h m s	° ' " +43 19	h m s	° ' " +20 15	h m s	° ' " +41 54
Jan. 0.7	6.695	40.55	8.364	29.00	25.927	30.89	25.831	45.75
10.6	6.995 ³⁰⁰	39.57 ⁹⁶	8.720 ³⁵⁶	28.94 ⁶	26.223 ²⁹⁶	29.73 ¹¹⁶	26.185 ³⁵⁴	45.58 ¹⁷
20.6	7.255 ²⁶⁰	38.91 ⁶⁶	9.029 ³⁰⁹	29.30 ³⁶	26.481 ²⁵⁸	28.85 ⁸⁸	26.494 ³⁰⁹	45.83 ²⁵
30.6	7.468 ²¹³	38.58 ³³	9.282 ²⁵³	30.07 ⁷⁷	26.694 ²¹³	28.30 ⁵⁵	26.749 ²⁵⁵	46.49 ⁶⁶
Feb. 9.5	7.630 ¹⁶²	38.56 ²	9.472 ¹⁹⁰	31.19 ¹¹²	26.857 ¹⁶³	28.06 ²⁴	26.942 ¹⁹³	47.51 ¹⁰²
19.5	7.739 ¹⁰⁹	38.84 ²⁸	9.597 ¹²⁵	32.59 ¹⁴⁰	26.968 ¹¹¹	28.09 ³	27.072 ¹³⁰	48.83 ¹³²
Mar. 1.5	7.795 ⁵⁶	39.35 ⁵¹	9.656 ⁵⁹	34.21 ¹⁶²	27.028 ⁶⁰	28.39 ³⁰	27.138 ⁶⁶	48.83 ¹⁵⁴
11.5	7.802 ⁷	40.07 ⁷²	9.652 ⁴	35.95 ¹⁷⁴	27.039 ¹¹	28.88 ⁴⁹	27.143 ⁵	50.37 ¹⁶⁹
21.4	7.764 ³⁸	40.92 ⁸⁵	9.592 ⁶⁰	37.73 ¹⁷⁸	27.007 ⁸²	29.55 ⁶⁷	27.091 ⁵²	53.80 ¹⁷⁴
31.4	7.689 ⁷⁵	41.84 ⁹²	9.484 ¹⁰⁸	39.47 ¹⁷⁴	26.939 ⁶⁸	30.31 ⁷⁶	26.998 ⁹⁸	55.51 ¹⁷¹
Apr. 10.4	7.587 ¹⁰²	42.78 ⁹⁴	9.339 ¹⁴⁵	41.07 ¹⁸⁰	26.843 ⁹⁶	31.12 ⁸¹	26.857 ¹³⁶	57.11 ¹⁸⁰
20.4	7.463 ¹²⁴	43.70 ⁹²	9.165 ¹⁷⁴	42.49 ¹⁴²	26.727 ¹¹⁶	31.93 ⁸¹	26.693 ¹⁶⁴	58.54 ¹⁴³
30.3	7.328 ¹³⁵	44.54 ⁸⁴	8.975 ¹⁹⁰	43.66 ¹¹⁷	26.599 ¹²⁸	32.71 ⁷⁸	26.512 ¹⁸¹	59.74 ¹²⁰
May 10.3	7.189 ¹³⁹	45.27 ⁷³	8.778 ¹⁹⁷	44.55 ⁸⁹	26.467 ¹³²	33.41 ⁷⁰	26.323 ¹⁸⁹	60.67 ⁹³
20.3	7.052 ¹³⁷	45.88 ⁶¹	8.583 ¹⁹⁵	45.11 ⁵⁶	26.336 ¹³¹	34.02 ⁶¹	26.134 ¹⁸⁹	61.29 ⁶²
30.2	6.923 ¹²⁹	46.33 ⁴⁵	8.397 ¹⁸⁶	45.34 ²³	26.213 ¹²³	34.51 ⁴⁹	25.954 ¹⁸⁰	61.59 ³⁰
June 9.2	6.808 ¹¹⁵	46.61 ²⁸	8.229 ¹⁶⁸	45.24 ¹⁰	26.103 ¹¹⁰	34.86 ³⁵	25.790 ¹⁶⁴	61.57 ²
19.2	6.709 ⁹⁹	46.73 ¹²	8.081 ¹⁴⁸	44.82 ⁴²	26.007 ⁹⁶	35.07 ²¹	25.645 ¹⁴⁵	61.22 ³⁵
29.2	6.631 ⁷⁸	46.67 ⁶	7.960 ¹²¹	44.06 ⁷⁶	25.931 ⁷⁶	35.14 ⁷	25.525 ¹²⁰	60.55 ⁶⁷
July 9.1	6.574 ⁵⁷	46.42 ²⁵	7.868 ⁹²	43.00 ¹⁰⁶	25.874 ⁵⁷	35.05 ⁹	25.432 ⁹³	59.58 ⁹⁷
19.1	6.541 ³³	46.01 ⁴¹	7.808 ⁶⁰	41.66 ¹³⁴	25.841 ³³	34.80 ²⁵	25.370 ⁶²	58.33 ¹²⁶
29.1	6.532 ⁹	45.42 ⁵⁹	7.782 ²⁶	40.06 ¹⁶⁰	25.831 ¹⁰	34.40 ⁴⁰	25.339 ³¹	56.83 ¹⁵⁰
Aug. 8.0	6.551 ¹⁹	44.65 ⁷⁷	7.791 ⁹	38.25 ¹⁸¹	25.848 ¹⁷	33.83 ⁵⁷	25.342 ³	55.09 ¹⁷⁴
18.0	6.597 ⁴⁶	43.71 ⁹⁴	7.836 ⁴⁵	36.22 ²⁰³	25.891 ⁴³	33.08 ⁷⁵	25.381 ³⁹	53.15 ¹⁹⁴
28.0	6.673 ⁷⁶	42.59 ¹¹²	7.920 ⁸⁴	34.02 ²²⁰	25.963 ⁷²	32.17 ⁹¹	25.457 ⁷⁶	51.01 ²¹⁴
Sept. 7.0	6.780 ¹⁰⁷	41.30 ¹²⁹	8.044 ¹²⁴	31.69 ²³³	26.066 ¹⁰³	31.07 ¹¹⁰	25.572 ¹¹⁵	48.74 ²²⁷
16.9	6.919 ¹⁸⁹	39.84 ¹⁴⁶	8.208 ¹⁶⁴	29.25 ²⁴⁴	26.200 ¹³⁴	29.80 ¹²⁷	25.726 ¹⁵⁴	46.35 ²³⁹
26.9	7.093 ¹⁷⁴	38.22 ¹⁶²	8.413 ²⁰⁵	26.75 ²⁵⁰	26.367 ¹⁶⁷	28.35 ¹⁴⁵	25.921 ¹⁹⁵	43.88 ²⁴⁷
Oct. 6.9	7.302 ²⁰⁹	36.46 ¹⁷⁶	8.660 ²⁴⁷	24.22 ²⁵³	26.569 ²⁰²	26.73 ¹⁶²	26.156 ²³⁵	41.37 ²⁵¹
16.9	7.543 ²⁴¹	34.57 ¹⁸⁹	8.948 ²⁸⁸	21.70 ²⁵²	26.804 ²³⁵	24.97 ¹⁷⁶	26.434 ²⁷⁸	38.86 ²⁵¹
26.8	7.817 ²⁷⁴	32.60 ¹⁹⁷	9.273 ³²⁵	19.27 ²⁴³	27.072 ²⁶⁸	23.08 ¹⁸⁹	26.750 ³¹⁶	36.41 ²⁴⁵
Nov. 5.8	8.121 ³⁰⁴	30.57 ²⁰³	9.635 ³⁶²	16.97 ²³⁰	27.368 ²⁹⁶	21.11 ¹⁹⁷	27.100 ³⁵⁰	34.07 ²³⁴
15.8	8.449 ³²⁸	28.55 ²⁰²	10.025 ³⁹⁰	14.87 ²¹⁰	27.688 ³²⁰	19.10 ²⁰¹	27.479 ³⁷⁹	31.93 ²¹⁴
25.7	8.793 ³⁴⁴	26.59 ¹⁹⁶	10.434 ⁴⁰⁹	13.01 ¹⁸⁶	28.026 ³³⁸	17.11 ¹⁹⁰	27.881 ⁴⁰²	30.01 ¹⁹²
Dec. 5.7	9.147 ³⁵⁴	24.74 ¹⁸⁵	10.853 ⁴¹⁹	11.48 ¹⁵³	28.373 ³⁴⁷	15.20 ¹⁹¹	28.292 ⁴¹¹	28.40 ¹⁶¹
15.7	9.498 ³⁵¹	23.08 ¹⁶⁶	11.271 ⁴¹⁸	10.32 ¹¹⁶	28.719 ³⁴⁶	13.42 ¹⁷⁸	28.704 ⁴¹²	27.15 ¹²⁶
25.7	9.838 ³⁴⁰	21.64 ¹⁴⁴	11.674 ⁴⁰³	9.56 ⁷⁶	29.054 ³³⁵	11.85 ¹⁵⁷	29.102 ³⁹⁸	26.29 ⁸⁶
35.6	10.153 ³¹⁵	20.49 ¹¹⁵	12.050 ³⁷⁶	9.24 ³²	29.365 ³¹¹	10.51 ¹³⁴	29.475 ³⁷³	25.86 ⁴³
Mean Place	4.638	53.14	5.897	45.96	23.938	42.71	23.446	62.74
Sec δ , Tan δ	1.093	+0.442	1.375	+0.943	1.066	+0.369	1.344	+0.898
$D\phi\alpha$, $D_\alpha\alpha$	+0.07	+0.03	+0.07	+0.06	+0.07	+0.02	+0.07	+0.05
$D\phi\delta$, $D_\alpha\delta$	-0.4	+0.5	-0.4	+0.5	-0.4	+0.4	-0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 H. Ursæ Majoris. Mag. 4.9		μ Hydre. Mag. 4.1		31 Leonis Minoris. Mag. 4.4		α Antile. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 18 s	° ' " +65 58 "	h m 10 22 s	° ' " -16 24 "	h m 10 23 s	° ' " +37 7 "	h m 10 23 s	° ' " -30 38 "
Jan. 0.7	13.88	51.59	6.239	45.16	7.602	42.12	22.799	40.04
10.6	14.45	52.43	6.521	47.78	7.942	41.66	23.096	43.01
20.6	14.95	53.78	6.764	50.37	8.240	41.63	23.350	46.09
30.6	15.35	55.58	6.963	52.89	8.488	41.99	23.556	49.17
Feb. 9.5	15.64	57.75	7.114	55.26	8.679	42.72	23.711	52.18
19.5	15.83	60.18	7.217	57.42	8.810	43.75	23.813	55.06
Mar. 1.5	15.91	62.79	7.272	59.37	8.881	45.04	23.863	57.75
11.5	15.88	65.44	7.282	61.05	8.895	46.48	23.865	60.20
21.4	15.74	68.02	7.252	62.47	8.857	48.02	23.825	62.35
31.4	15.51	70.43	7.189	63.60	8.775	49.57	23.749	64.20
Apr. 10.4	15.21	72.56	7.101	64.46	8.657	51.05	23.644	65.71
20.4	14.86	74.34	6.994	65.04	8.513	52.40	23.517	66.88
30.3	14.46	75.71	6.873	65.36	8.351	53.57	23.377	67.69
May 10.3	14.04	76.62	6.748	65.42	8.182	54.52	23.227	68.15
20.3	13.62	77.05	6.622	65.23	8.013	55.19	23.076	68.25
30.2	13.22	76.98	6.500	64.81	7.852	55.60	22.928	67.99
June 9.2	12.83	76.42	6.387	64.16	7.702	55.71	22.787	67.39
19.2	12.48	75.38	6.285	63.32	7.570	55.52	22.657	66.49
29.2	12.18	73.90	6.197	62.30	7.460	55.06	22.543	65.29
July 9.1	11.94	72.02	6.128	61.13	7.374	54.31	22.447	63.83
19.1	11.75	69.76	6.077	59.86	7.316	53.31	22.373	62.15
29.1	11.63	67.19	6.049	58.53	7.266	52.05	22.323	60.32
Aug. 8.1	11.57	64.37	6.045	57.18	7.285	50.56	22.303	58.40
18.0	11.58	61.33	6.069	55.87	7.318	48.87	22.313	56.45
28.0	11.67	58.14	6.121	54.67	7.385	47.00	22.356	54.54
Sept. 7.0	11.83	54.87	6.205	53.63	7.488	44.95	22.438	52.77
16.9	12.08	51.57	6.323	52.81	7.627	42.76	22.559	51.22
26.9	12.39	48.31	6.477	52.26	7.805	40.47	22.721	49.95
Oct. 6.9	12.77	45.14	6.666	52.05	8.022	38.09	22.924	49.04
16.9	13.22	42.16	6.892	52.21	8.279	35.68	23.168	48.55
26.8	13.73	39.40	7.152	52.77	8.574	33.29	23.448	48.53
Nov. 5.8	14.30	36.96	7.440	53.72	8.902	30.97	23.761	49.02
15.8	14.92	34.89	7.753	55.07	9.259	28.78	24.099	49.99
25.8	15.58	33.27	8.082	56.78	9.637	26.78	24.455	51.44
Dec. 5.7	16.25	32.13	8.419	58.81	10.027	25.04	24.817	53.34
15.7	16.91	31.53	8.754	61.09	10.418	23.60	25.175	55.64
25.7	17.56	31.48	9.075	63.56	10.799	22.53	25.517	58.26
35.6	18.16	32.00	9.372	66.13	11.155	21.85	25.831	61.11
Mean Place	10.162	72.23	4.536	43.67	5.378	58.41	21.115	42.55
Sec δ , Tan δ	2.457	+2.244	1.043	-0.295	1.254	+0.757	1.163	-0.593
$D\psi\alpha$, $D\omega\alpha$	+0.09	+0.14	+0.06	-0.02	+0.07	+0.05	+0.05	-0.04
$D\psi\delta$, $D\omega\delta$	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	36 Ursæ Majoris. Mag. 4.8		9 H. Draconis. Mag. 5.0		ρ Leonis. Mag. 3.8		33 Sextantis. Mag. 6.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 25	° ' " +56 23	h m 10 28	° ' " +76 7	h m 10 28	° ' " +9 43	h m 10 37	° ' " -1 18
Jan. 0.7	22.448	63.78	10.19	65.99	28.369	53.58	12.528	23.06
10.6	22.900 ⁴⁵²	64.16 ³⁸	11.11 ⁹²	67.07 ¹⁰⁸	28.659 ²⁹⁰	51.91 ¹⁶⁷	12.817 ²⁸⁹	25.17 ²¹¹
20.6	23.295 ³⁹⁵	65.03 ⁸⁷	11.90 ⁷⁹	68.68 ¹⁶¹	28.914 ²⁵⁵	50.46 ¹⁴⁵	13.072 ²⁵⁵	27.15 ¹⁹⁸
30.6	23.621 ³²⁶	66.36 ¹³³	12.55 ⁶⁵	70.77 ²⁰⁹	29.128 ²¹⁴	49.27 ¹¹⁹	13.287 ²¹⁵	28.95 ¹⁸⁰
Feb. 9.6	23.871 ²⁵⁰	68.08 ¹⁷²	13.04 ⁴⁹	73.23 ²⁴⁶	29.295 ¹⁶⁷	48.35 ⁹²	13.456 ¹⁶⁹	30.51 ¹⁵⁶
19.5	24.038	70.11	13.35	75.98	29.413	47.72	13.578	31.84
Mar. 1.5	24.120 ⁸²	72.84 ²²³	13.46 ¹¹	78.88 ²⁹⁰	29.483 ⁷⁰	47.35 ³⁷	13.653 ⁷⁵	32.90 ¹⁰⁶
11.5	24.120 ⁰	74.67 ²³³	13.40 ⁶	81.81 ²⁹³	29.506 ²³	47.23 ¹²	13.684 ³¹	33.70 ⁸⁰
21.4	24.045 ⁷⁵	77.00 ²³³	13.15 ²⁵	84.64 ²⁸³	29.489 ¹⁷	47.31 ⁸	13.674 ¹⁰	34.27 ⁵⁷
31.4	23.904 ¹⁴¹	79.23 ²²³	12.76 ³⁹	87.26 ²⁶²	29.438 ⁵¹	47.57 ²⁶	13.632 ⁴²	34.62 ³⁵
Apr. 10.4	23.709 ¹⁹⁵	81.26 ²⁰⁸	12.24 ⁵²	89.59 ²³³	29.359 ⁷⁹	47.95 ³⁸	13.562 ⁷⁰	34.76 ¹⁴
20.4	23.472 ²³⁷	83.01 ¹⁷⁵	11.61 ⁶³	91.51 ¹⁹²	29.260 ⁹⁹	48.43 ⁴⁸	13.472 ⁹⁰	34.73 ³
30.3	23.206 ²⁶⁶	84.44 ¹⁴³	10.89 ⁷²	92.97 ¹⁴⁶	29.148 ¹¹²	48.97 ⁵⁴	13.368 ¹⁰⁴	34.54 ¹⁹
May 10.3	22.925 ²⁸¹	85.47 ¹⁰³	10.14 ⁷⁵	93.91 ⁹⁴	29.029 ¹¹⁹	49.54 ⁵⁷	13.257 ¹¹¹	34.22 ³²
20.3	22.641 ²⁸⁴	86.08 ⁶¹	9.37 ⁷⁷	94.32 ⁴¹	28.912 ¹¹⁷	50.12 ⁵⁸	13.144 ¹¹³	33.80 ⁴²
30.3	22.364 ²⁷⁷	86.26 ¹⁸	8.69 ⁷⁷	94.19 ¹³	28.798 ¹¹⁴	50.68 ⁵⁶	13.034 ¹¹⁰	33.29 ⁵¹
June 9.2	22.105 ²⁵⁹	86.00 ²⁶	7.86 ⁷⁴	93.51 ⁶⁸	28.693 ¹⁰⁵	51.20 ⁵²	12.930 ¹⁰⁴	32.70 ⁵⁹
19.2	21.869 ²³⁶	85.30 ⁷⁰	7.17 ⁶⁹	92.31 ¹²⁰	28.600 ⁹³	51.68 ⁴⁸	12.836 ⁹⁴	32.05 ⁶⁵
29.2	21.666 ²⁰³	84.20 ¹¹⁰	6.56 ⁶¹	90.62 ¹⁶⁹	28.524 ⁷⁶	52.10 ⁴²	12.755 ⁸¹	31.37 ⁶⁶
July 9.1	21.500 ¹⁶⁶	82.72 ¹⁴⁸	6.04 ⁵²	88.49 ²¹³	28.464 ⁶⁰	52.45 ³⁵	12.690 ⁶⁵	30.68 ⁶⁹
19.1	21.375 ⁸¹	80.89 ²¹⁵	5.62 ³¹	85.97 ²⁸⁶	28.423 ¹⁹	52.68 ¹⁴	12.641 ²⁹	29.99 ⁶⁵
29.1	21.294 ³⁴	78.74 ²⁴¹	5.31 ²⁰	83.11 ³¹⁴	28.404 ³	52.82 ²	12.612 ⁸	29.34 ⁵⁹
Aug. 8.1	21.260 ¹⁶	76.33 ²⁶⁴	5.11 ⁷	79.97 ³³⁴	28.407 ²⁸	52.84 ¹³	12.604 ¹⁷	28.75 ⁴⁸
18.0	21.276 ⁶⁷	73.69 ²⁸¹	5.04 ⁶	76.63 ³⁵⁰	28.435 ⁵⁴	52.71 ³⁰	12.621 ⁴²	28.27 ³⁵
28.0	21.343 ¹²⁰	70.88 ²⁹⁵	5.10 ²⁰	73.13 ³⁵⁷	28.489 ⁸⁵	52.41 ⁴⁸	12.663 ⁷³	27.92 ¹⁶
Sept. 7.0	21.463	67.93	5.30	69.56	28.574	51.93	12.736	27.76
17.0	21.637 ¹⁷⁴	64.90 ³⁰³	5.61 ³¹	65.98 ³⁵⁸	28.689 ¹¹⁵	51.23 ⁷⁰	12.840 ¹⁰⁴	27.80 ⁴
26.9	21.866 ²²⁹	61.86 ³⁰⁴	6.05 ⁴⁴	62.48 ³⁵⁰	28.837 ¹⁴⁸	50.33 ⁹⁰	12.976 ¹³⁶	28.10 ³⁰
Oct. 6.9	22.151 ²⁸⁵	58.85 ³⁰¹	6.62 ⁵⁷	59.11 ³³⁷	29.018 ¹⁸¹	49.19 ¹¹⁴	13.148 ¹⁷²	28.67 ⁵⁷
16.9	22.488 ³³⁷	55.94 ²⁹¹	7.31 ⁶⁹	55.94 ³¹⁷	29.235 ²¹⁷	47.85 ¹³⁴	13.356 ²⁰⁶	29.51 ⁸⁴
26.8	22.876 ³⁸⁸	53.19 ²⁷⁵	8.11 ⁸⁰	53.06 ²⁸⁸	29.484 ²⁴⁹	46.28 ¹⁵⁷	13.596 ²⁴⁰	30.65 ¹¹⁴
Nov. 5.8	23.310 ⁴³⁴	50.68 ²⁵¹	9.00 ⁸⁹	50.55 ²⁵¹	29.762 ²⁷⁸	44.53 ¹⁷⁵	13.868 ²⁷²	32.07 ¹⁴²
15.8	23.782 ⁴⁷²	48.46 ²²²	9.97 ⁹⁷	48.46 ²⁰⁹	30.067 ³⁰⁵	42.63 ¹⁹⁰	14.167 ²⁹⁰	33.76 ¹⁶⁹
25.8	24.284 ⁵⁰²	46.59 ¹⁸⁷	10.98 ¹⁰²	46.87 ¹⁵⁹	30.389 ³²²	40.63 ²⁰⁰	14.484 ³¹⁷	35.66 ¹⁹⁰
Dec. 5.7	24.801 ⁵¹⁷	45.16 ¹⁴³	12.04 ¹⁰⁵	45.82 ¹⁰⁵	30.722 ³³³	38.59 ²⁰⁴	14.813 ³²⁹	37.73 ²⁰⁷
15.7	25.319	44.20	13.10	45.37	31.056	36.57	15.144	39.89
25.7	25.823 ⁵⁰⁴	43.75 ⁴⁵	14.13 ¹⁰³	45.50 ¹³	31.381 ³²⁵	34.63 ¹⁹⁴	15.466 ³²²	42.08 ²¹⁹
35.7	26.298 ⁴⁷⁵	43.82 ⁷	15.10 ⁹⁷	46.24 ⁷⁴	31.685 ³⁰⁴	32.85 ¹⁷⁸	15.768 ³⁰²	44.23 ²¹⁵
Mean Place	19.572	83.75	4.749	88.04	26.559	62.93	10.837	16.79
Sec δ , Tan δ	1.807	+1.505	4.173	+4.052	1.015	+0.171	1.000	-0.023
$D\psi\alpha$, $D_\omega\alpha$	+0.08	+0.09	+0.10	+0.25	+0.06	+0.01	+0.06	0.00
$D\psi\delta$, $D_\omega\delta$	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Leonis Minoris. Mag. 5.0		θ Argus. Mag. 3.0		42 Leonis Minoris. Mag. 5.4		77 Argus. Var. 1.6-6.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 38	° ' " +23 36	h m 10 39	° ' " -63 57	h m 10 41	° ' " +31 6	h m 10 41	° ' " -59 14
	s	"	s	"	s	"	s	"
Jan. 0.7	56.266	70.26	61.36	25.64	17.195	55.59	52.004	43.28
10.6	56.580 314	69.12 114	61.85 49	28.74 310	17.529 334	54.74 85	52.439 435	46.38 310
20.6	56.861 281	68.31 81	62.26 41	32.18 344	17.825 296	54.28 46	52.811 372	49.82 344
30.6	57.097 236	67.84 47	62.59 33	35.86 368	18.077 252	54.22 6	53.113 302	53.46 364
Feb. 9.6	57.286 189	67.73 11	62.83 24	39.69 383	18.278 201	54.53 31	53.336 223	57.23 377
	136	20	15	387	146	64	144	379
19.5	57.422	67.93	62.98	43.56	18.424	55.17	53.480	61.02
Mar. 1.5	57.506 84	68.41 48	63.04 6	47.40 384	18.513 89	56.09 92	53.548 68	64.76 374
11.5	57.541 35	69.12 71	63.02 2	51.10 370	18.549 36	57.24 118	53.541 7	68.34 358
21.4	57.530 11	69.99 87	62.91 11	54.58 348	18.537 12	58.52 125	53.467 74	71.71 337
31.4	57.482 48	70.98 99	62.74 17	57.79 321	18.482 55	59.87 135	53.331 136	74.79 308
	82	104	23	287	89	136	187	274
Apr. 10.4	57.400	72.02	62.51	60.66	18.393	61.23	53.144	77.53
20.4	57.295 105	73.06 104	62.23 28	63.13 247	18.277 116	62.52 129	52.914 230	79.89 236
30.3	57.173 122	74.03 97	61.91 32	65.16 203	18.143 134	63.69 117	52.651 263	81.81 192
May 10.3	57.043 130	74.91 88	61.56 35	66.73 157	17.999 144	64.69 100	52.363 288	83.25 144
20.3	56.911 132	75.66 75	61.18 38	67.79 106	17.851 148	65.51 82	52.058 305	84.22 97
	129	60	38	55	144	59	312	45
30.3	56.782	76.26	60.80	68.34	17.707	66.10	51.746	84.67
June 9.2	56.661 121	76.68 42	60.42 38	68.37 3	17.571 136	66.44 34	51.435 311	84.63 4
19.2	56.553 108	76.91 23	60.05 37	67.87 50	17.448 128	66.54 10	51.134 301	84.10 53
29.2	56.460 93	76.96 5	59.70 35	66.88 99	17.341 107	66.37 17	50.849 285	83.09 101
July 9.1	56.385 75	76.81 15	59.38 32	65.43 145	17.253 88	65.96 41	50.589 260	81.62 147
	55	34	28	188	65	67	226	187
19.1	56.330 32	76.47 53	59.10 23	63.55 225	17.188 42	65.29 90	50.363 185	79.75 222
29.1	56.298 10	75.94 74	58.87 18	61.30 256	17.146 15	64.39 123	50.178 137	77.53 250
Aug. 8.1	56.288 18	75.20 92	58.69 11	58.74 276	17.131 12	63.26 113	50.041 80	75.03 269
18.0	56.306 46	74.28 113	58.58 2	55.98 288	17.143 44	61.92 156	49.961 18	72.34 279
28.0	56.352 77	73.15 132	58.56 5	53.10 289	17.187 75	60.36 174	49.943 51	69.55 279
Sept. 7.0	56.429	71.83	58.61	50.21	17.262	58.62	49.994	66.76
17.0	56.539 110	70.33 150	58.75 14	47.42 270	17.374 112	56.70 192	50.117 123	64.08 268
26.9	56.682 143	68.65 168	58.97 22	44.84 258	17.523 149	54.62 208	50.314 197	61.62 246
Oct. 6.9	56.863 181	66.81 184	59.28 31	42.59 225	17.709 186	52.43 219	50.587 273	59.49 213
16.9	57.081 218	64.82 199	59.67 39	40.76 183	17.934 225	50.14 229	50.928 341	57.77 172
	253	209	46	134	264	234	406	122
26.8	57.334	62.73	60.13	39.42	18.198	47.80	51.334	56.55
Nov. 5.8	57.619 285	60.58 215	60.66 53	38.66 76	18.497 299	45.46 234	51.794 460	55.91 64
15.8	57.934 315	58.42 216	61.23 57	38.52 14	18.825 328	43.18 228	52.296 502	55.89 2
25.8	58.270 336	56.30 212	61.84 61	39.04 52	19.178 353	41.03 215	52.825 529	56.49 60
Dec. 5.7	58.622 352	54.28 202	62.45 61	40.19 115	19.546 368	39.06 198	53.364 539	57.72 123
	353	184	59	176	372	172	532	183
15.7	58.975	52.44	63.04	41.95	19.918	37.33	53.896	59.55
25.7	59.321 346	50.84 180	63.61 57	44.28 233	20.284 366	35.91 142	54.403 507	61.93 238
35.7	59.650 329	49.51 133	64.13 52	47.09 281	20.630 346	34.85 106	54.869 466	64.76 283
Mean Place	54.375	83.92	59.488	35.70	15.213	71.33	50.234	52.58
Sec δ, Tan δ	1.091	+0.437	2.278	-2.047	1.168	+0.604	1.956	-1.681
Dψ α, Dω α	+0.07	+0.03	+0.04	-0.13	+0.07	+0.04	+0.05	-0.11
Dψ δ, Dω δ	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Argus. Mag. 2.8			ζ Leonis. Mag. 5.3			δ^3 Chamaeleon. Mag. 4.6			γ Hydræ. Mag. 3.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	10 43		-48 58	10 44		+10 58	10 44		-80 5	10 45		-15 45
Jan. 0.7	13.403		46.71	55.517		54.44	64.00		56.53	33.280		33.57
10.6	13.771	368	49.80	55.818	301	52.76	65.05	105	59.37	33.577	297	36.12
20.6	14.089	318	53.14	56.086	268	51.91	65.96	91	62.65	33.840	268	38.68
30.6	14.350	261	56.66	56.314	228	50.15	66.66	70	66.26	34.061	221	41.12
Feb. 9.6	14.550	200	60.23	56.497	183	49.27	67.16	50	70.06	34.237	176	43.44
19.5	14.684	134	63.79	56.632	135	48.69	67.44	28	74.01	34.366	129	45.58
Mar. 1.5	14.757	73	67.23	56.718	86	48.39	67.52	8	77.99	34.447	81	47.51
11.5	14.770	18	70.50	56.758	327	48.33	67.38	14	81.92	34.484	37	49.17
21.5	14.728	42	73.53	56.758	303	48.50	67.05	33	85.69	34.480	4	50.58
31.4	14.638	90	76.27	56.721	274	48.84	66.55	50	89.24	34.442	38	51.72
Apr. 10.4	14.510	128	78.66	56.654	239	49.31	65.88	67	92.50	34.374	68	52.60
20.4	14.348	162	80.67	56.566	201	49.87	65.08	80	95.39	34.286	88	53.21
30.3	14.161	187	82.28	56.463	161	50.48	64.17	91	97.96	34.182	104	53.57
May 10.3	13.957	204	83.44	56.351	116	51.12	63.16	101	99.89	34.069	118	53.68
20.3	13.740	217	84.16	56.236	115	51.75	62.08	108	101.39	33.951	118	53.55
30.3	13.521	219	84.41	56.124	112	52.36	60.95	113	102.38	33.835	116	53.20
June 9.2	13.303	218	84.21	56.017	107	52.91	59.82	113	102.80	33.721	114	52.64
19.2	13.094	209	83.56	55.919	98	53.39	58.70	112	102.68	33.617	104	51.89
29.2	12.897	197	82.48	55.835	84	53.80	57.62	108	102.02	33.523	94	50.98
July 9.2	12.720	177	81.02	55.766	69	54.11	56.61	101	100.83	33.442	81	49.92
19.1	12.568	152	79.20	55.713	53	54.31	55.71	90	99.13	33.379	63	48.74
29.1	12.446	122	77.09	55.680	38	54.39	54.94	77	97.02	33.335	44	47.52
Aug. 8.1	12.361	85	74.76	55.668	12	54.34	54.34	60	94.54	33.313	22	46.27
18.0	12.317	44	72.29	55.681	13	54.12	53.91	43	91.75	33.314	1	45.04
28.0	12.321	4	69.75	55.719	38	53.74	53.70	21	88.79	33.345	81	43.90
Sept. 7.0	12.375	54	67.25	55.787	68	53.18	53.69	1	85.72	33.407	62	42.90
17.0	12.484	109	64.89	55.886	99	52.99	53.92	23	82.71	33.502	85	42.10
26.9	12.650	166	62.77	56.017	131	51.40	54.37	45	79.83	33.633	121	41.55
Oct. 6.9	12.873	228	60.98	56.184	167	50.17	55.05	68	77.22	33.802	169	41.33
16.9	13.153	280	59.62	56.387	208	48.74	55.93	86	74.96	34.009	207	41.45
26.9	13.483	330	58.75	56.624	237	47.09	56.98	105	73.17	34.253	244	41.93
Nov. 5.8	13.857	374	58.43	56.895	271	45.26	58.20	122	71.95	34.529	276	42.81
15.8	14.267	410	58.69	57.194	299	43.30	59.52	132	71.34	34.834	305	44.08
25.8	14.702	435	59.55	57.513	319	41.25	60.90	138	71.39	35.158	324	45.70
Dec. 5.7	15.146	444	60.99	57.846	333	39.16	62.29	139	72.09	35.495	337	47.64
15.7	15.586	440	62.98	58.183	337	37.11	63.66	137	73.46	35.835	340	49.84
25.7	16.009	423	65.44	58.514	331	35.15	64.95	129	75.42	36.166	381	52.22
35.7	16.400	391	68.29	58.828	314	33.35	66.11	116	77.96	36.476	310	54.71
Mean Place	11.758		53.94	53.786		64.66	61.016		68.64	31.690		31.67
Sec δ , Tan δ	1.524		-1.150	1.019		+0.194	5.819		-5.733	1.039		-0.282
$D\phi\alpha$, $D_\omega\alpha$	+0.05		-0.07	+0.06		+0.01	+0.01		-0.36	+0.06		-0.02
$D\phi\delta$, $D_\omega\delta$	-0.4		+0.3	-0.4		+0.3	-0.4		+0.3	-0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	46 Leonis Minoris. Mag. 3.9		54 Leonis. Mag. 4.5		Antlia. Mag. 4.7		Groombridge 1706. Mag. 6.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 48	° ' " +34 39	h m 10 51	° ' " +25 10	h m 10 52	° ' " -36 41	h m 10 53	° ' " +78 12
Jan. 0.7	42.459	28.78	9.150	79.35	52.647	24.65	26.65	30.81
10.6	42.807 ³⁴⁸	28.02 ⁷⁶	9.475 ³²⁵	78.20 ¹¹⁵	52.981 ³³⁴	27.56 ²⁹¹	27.74 ¹⁰⁹	31.63 ⁸²
20.6	43.118 ³¹¹	27.67 ³⁵	9.766 ²⁹¹	77.40 ⁸⁰	53.274 ²⁹³	30.67 ³¹¹	28.72 ⁹⁸	33.04 ¹⁴¹
30.6	43.384 ²⁶⁶	27.75 ⁸	10.016 ²⁵⁰	76.96 ⁴⁴	53.520 ²⁴⁶	33.86 ³¹⁹	29.55 ⁸³	34.96 ¹⁹²
Feb. 9.6	43.598 ²¹⁴	28.21 ⁴⁶	10.218 ²⁰²	76.89 ⁷	53.716 ¹⁹⁶	37.06 ³²⁰	30.20 ⁶⁶	37.30 ²⁸⁴
19.5	43.757 ¹⁵⁹	29.02 ⁸¹	10.368 ¹⁵⁰	77.16 ²⁷	53.857 ¹⁴¹	40.18 ³¹²	30.66 ⁴⁶	39.99 ²⁶⁹
Mar. 1.5	43.858 ¹⁰¹	30.13 ¹¹¹	10.466 ⁹⁸	77.71 ⁵⁵	53.945 ⁸⁸	43.16 ²⁹⁸	30.90 ²⁴	42.90 ²⁹¹
11.5	43.902 ⁴⁴	31.45 ¹²⁸	10.514 ⁴⁹	78.52 ⁸¹	53.982 ³⁷	45.95 ²⁷⁹	30.92 ²	45.89 ²⁹⁹
21.5	43.896 ⁶	32.92 ¹⁴⁷	10.516 ²	79.49 ⁹⁷	53.973 ⁹	48.48 ²⁵³	30.75 ¹⁷	48.84 ²⁹⁵
31.4	43.846 ⁵⁰	34.46 ¹⁵⁴	10.476 ⁴⁰	80.59 ¹¹⁰	53.923 ⁵⁰	50.72 ²²⁴	30.37 ³⁸	51.65 ²⁸¹
Apr. 10.4	43.757 ⁸⁹	35.98 ¹⁵²	10.403 ⁷³	81.74 ¹¹⁵	53.839 ⁸⁴	52.66 ¹⁹⁴	29.83 ⁵⁴	54.19 ²⁶⁴
20.4	43.640 ¹¹⁷	37.42 ¹⁴⁴	10.306 ⁹⁷	82.88 ¹¹⁴	53.730 ¹⁰⁹	54.24 ¹⁵⁸	29.16 ⁶⁷	56.37 ²¹⁸
30.3	43.502 ¹³⁸	38.73 ¹³¹	10.188 ¹¹⁸	83.97 ¹⁰⁹	53.599 ¹³¹	55.46 ¹²²	28.36 ⁸⁰	58.10 ¹⁷³
May 10.3	43.351 ¹⁵¹	39.83 ¹¹⁰	10.060 ¹²⁸	84.95 ⁹⁸	53.453 ¹⁴⁶	56.30 ⁹⁴	27.49 ⁸⁷	59.35 ¹²⁵
20.3	43.195 ¹⁵⁶	40.71 ⁸⁸	9.929 ¹³¹	85.78 ⁸³	53.298 ¹⁵⁵	56.77 ⁴⁷	26.57 ⁹²	60.08 ⁷³
30.3	43.041 ¹⁵⁴	41.33 ⁶²	9.798 ¹³¹	86.44 ⁶⁶	53.140 ¹⁵⁸	56.85 ⁸	25.64 ⁹⁸	60.24 ¹⁶
June 9.2	42.894 ¹⁴⁷	41.67 ³⁴	9.673 ¹²⁵	86.92 ⁴⁸	52.983 ¹⁵⁷	56.56 ²⁹	24.73 ⁹¹	59.85 ³⁹
19.2	42.759 ¹³⁵	41.73 ⁶	9.559 ¹¹⁴	87.18 ²⁶	52.833 ¹⁵⁰	55.90 ⁶⁶	23.86 ⁸⁷	58.90 ⁹⁵
29.2	42.641 ¹¹⁸	41.49 ²⁴	9.457 ¹⁰²	87.24 ⁶	52.692 ¹⁴¹	54.90 ¹⁰⁰	23.06 ⁸⁰	57.44 ¹⁴⁶
July 9.2	42.540 ¹⁰¹	40.98 ⁵¹	9.372 ⁸⁵	87.09 ¹⁵	52.566 ¹²⁶	53.58 ¹³²	22.34 ⁷²	55.49 ¹⁹⁵
19.1	42.463 ⁷⁷	40.19 ⁷⁹	9.307 ⁶⁵	86.71 ³⁸	52.459 ¹⁰⁷	51.99 ¹⁵⁹	21.73 ⁶¹	53.13 ²³⁶
29.1	42.410 ⁵³	39.14 ¹⁰⁶	9.262 ⁴⁵	86.13 ⁵⁸	52.372 ⁸⁷	50.18 ¹⁸¹	21.24 ⁴⁹	50.38 ²⁷⁵
Aug. 8.1	42.384 ²⁶	37.84 ¹⁸⁰	9.241 ²¹	85.32 ⁸¹	52.314 ⁵⁸	48.20 ¹⁹⁸	20.89 ³⁵	47.30 ³⁰⁸
18.0	42.386 ²	36.30 ¹⁸⁴	9.245 ⁴	84.32 ¹⁰⁰	52.286 ²⁸	46.13 ²⁰⁷	20.69 ²³	43.98 ³³³
28.0	42.421 ³⁵	34.55 ¹⁷⁵	9.278 ³³	83.10 ¹²²	52.294 ⁸	44.05 ²⁰⁸	20.68 ⁸	40.46 ³⁵²
Sept. 7.0	42.489 ⁶⁸	32.60 ¹⁹⁵	9.342 ⁶⁴	81.68 ¹⁴²	52.341 ⁴⁷	42.02 ²⁰³	20.66 ⁸	36.82 ³⁶⁴
17.0	42.594 ¹⁰⁵	30.47 ²¹³	9.438 ⁹⁶	80.07 ¹⁶¹	52.433 ⁹²	40.16 ¹⁸⁶	20.88 ²²	33.12 ³⁷⁰
26.9	42.737 ¹⁴³	28.19 ²²⁸	9.570 ¹³²	78.28 ¹⁷⁹	52.569 ¹²⁶	38.53 ¹⁶³	21.26 ³⁸	29.46 ³⁶⁶
Oct. 6.9	42.920 ¹⁸³	25.81 ²²⁸	9.740 ¹⁷⁰	76.33 ¹⁹⁵	52.753 ¹⁸⁴	37.23 ¹³⁰	21.80 ⁶⁴	25.91 ³⁵⁵
16.9	43.145 ²²⁵	23.36 ²⁴⁵	9.947 ²⁰⁷	74.23 ²¹⁰	52.983 ²³⁰	36.32 ⁹¹	22.47 ⁶⁷	22.52 ³³⁹
26.9	43.409 ²⁶⁴	20.87 ²⁴⁹	10.192 ²⁴⁵	72.04 ²¹⁹	53.257 ²⁷⁴	35.87 ⁴⁵	23.28 ⁸¹	19.39 ³¹³
Nov. 5.8	43.710 ³⁰¹	18.40 ²⁴⁷	10.471 ²⁷⁹	69.79 ²²⁵	53.572 ³¹⁵	35.91 ⁴	24.22 ⁹⁴	16.59 ²⁸⁰
15.8	44.043 ³³³	16.02 ²³⁸	10.782 ³¹¹	67.53 ²²⁶	53.918 ³⁴⁶	36.47 ⁵⁶	25.28 ¹⁰⁶	14.21 ²³⁸
25.8	44.404 ³⁶¹	13.80 ²²²	11.117 ³³⁵	65.33 ²²⁰	54.290 ³⁷²	37.56 ¹⁰⁹	26.41 ¹¹³	12.30 ¹⁹¹
Dec. 5.7	44.780 ³⁷⁶	11.80 ²⁰⁰	11.469 ³⁵²	63.26 ²⁰⁷	54.673 ³⁸³	39.14 ¹⁵⁸	27.59 ¹¹⁸	10.95 ¹³⁵
15.7	45.163 ³⁸²	10.08 ¹⁷²	11.826 ³⁵⁷	61.36 ¹⁹⁰	55.058 ³⁸⁵	41.18 ²⁰⁴	28.80 ¹²¹	10.18 ⁷⁷
25.7	45.541 ³⁷⁸	8.69 ¹³⁹	12.178 ³⁵²	59.72 ¹⁶⁴	55.431 ³⁷³	43.61 ²⁴³	30.00 ¹²⁰	10.02 ¹⁶
35.7	45.903 ³⁶²	7.69 ¹⁰⁰	12.514 ³³⁶	58.37 ¹³⁵	55.782 ³⁵¹	46.37 ²⁷⁶	31.15 ¹¹⁵	10.48 ⁴⁶
Mean Place	40.473	45.71	7.318	93.92	51.107	28.88	21.248	54.54
Sec δ , Tan δ	1.216	+0.691	1.105	+0.470	1.247	-0.745	4.894	+4.790
D ϕ α , D ω α	+0.07	+0.04	+0.07	+0.03	+0.06	-0.05	+0.10	+0.31
D ϕ δ , D ω δ	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

APPARENT PLACES OF STARS, 1917.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Crateris. Mag. 4.2		δ Leonis. Mag. 5.0		β Ursae Majoris. Mag. 2.4		α Ursae Majoris. Mag. 2.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 55	° ' " -17 51	h m 10 56	° ' " + 4 3	h m 10 56	° ' " +56 48	h m 10 58	° ' " +62 11
Jan. 0.7	45.271	25.59	18.100	39.73	53.125	77.52	39.93	35.00
10.7	45.575 ³⁰⁴	28.17 ²⁵⁸	18.402 ³⁰²	37.77 ¹⁹⁶	53.604 ⁴⁷⁹	77.57 ⁵	40.48 ⁵⁵	35.23 ²³
20.6	45.846 ²⁷¹	30.76 ²⁵⁹	18.673 ²⁷¹	35.99 ¹⁷⁸	54.036 ⁴³²	78.16 ⁵⁹	40.97 ⁴⁹	36.01 ⁷⁸
30.6	46.078 ²³²	33.29 ²⁵³	18.907 ²³⁴	34.44 ¹⁵⁵	54.407 ³⁷¹	79.25 ¹⁰⁹	41.39 ⁴²	37.32 ¹³¹
Feb. 9.6	46.264 ¹⁸⁶	35.72 ²⁴³	19.096 ¹⁸⁹	33.15 ¹²⁹	54.707 ³⁰⁰	80.80 ¹⁵⁵	41.72 ³³	39.08 ¹⁷⁶
19.5	46.401 ¹³⁷	37.98 ²²⁶	19.239 ¹⁴³	32.13 ¹⁰²	54.926 ²¹⁹	82.72 ¹⁹²	41.97 ²⁵	41.22 ²¹⁴
Mar. 1.5	46.492 ⁹¹	40.02 ²⁰⁴	19.335 ⁹⁶	31.38 ⁷⁵	55.062 ¹³⁶	84.93 ²²¹	42.13 ¹⁶	43.62 ²⁴⁰
11.5	46.539 ⁴⁷	41.82 ¹⁸⁰	19.387 ⁵²	30.89 ⁴⁹	55.115 ⁵³	87.31 ²³⁸	42.19 ⁶	46.20 ²⁵⁸
21.5	46.544 ⁵	43.36 ¹⁵⁴	19.398 ¹¹	30.65 ²⁴	55.092 ²³	89.76 ²⁴⁵	42.14 ⁵	48.83 ²⁶³
31.4	46.513 ³¹	44.65 ¹²⁹	19.372 ²⁶	30.60 ⁵	54.997 ⁹⁵	92.17 ²⁴¹	42.02 ¹²	51.38 ²⁵⁵
Apr. 10.4	46.453 ⁶⁰	45.65 ¹⁰⁰	19.318 ⁵⁴	30.74 ¹⁴	54.841 ¹⁵⁶	94.44 ²²⁷	41.83 ¹⁹	53.78 ²⁴⁰
20.4	46.371 ⁸²	46.38 ⁷³	19.241 ⁷⁷	31.03 ²⁹	54.636 ²⁰⁵	96.48 ²⁰⁴	41.58 ²⁵	55.91 ²¹³
30.4	46.271 ¹⁰⁰	46.86 ⁴⁸	19.148 ⁹³	31.42 ³⁹	54.395 ²⁴¹	98.22 ¹⁷⁴	41.28 ⁹⁰	57.70 ¹⁷⁹
May 10.3	46.161 ¹¹⁰	47.07 ²¹	19.045 ¹⁰³	31.90 ⁴⁸	54.127 ²⁶⁸	99.61 ¹³⁹	40.96 ³²	59.11 ¹⁴¹
20.3	46.043 ¹¹⁸	47.04 ³	18.937 ¹⁰⁸	32.44 ⁵⁴	53.847 ²⁸⁰	100.57 ⁹⁶	40.61 ³⁵	60.07 ⁹⁶
30.3	45.925 ¹¹⁸	46.76 ²⁸	18.829 ¹⁰⁸	33.01 ⁵⁷	53.564 ²⁸³	101.10 ⁵³	40.26 ³⁵	60.55 ⁴⁸
June 9.2	45.811 ¹¹⁴	46.27 ⁴⁹	18.725 ¹⁰⁴	33.60 ⁵⁹	53.289 ²⁷⁵	101.19 ⁹	39.92 ³⁴	60.55 ⁰
19.2	45.701 ¹¹⁰	45.56 ⁷¹	18.628 ⁹⁷	34.18 ⁵⁸	53.031 ²⁵⁸	100.82 ³⁷	39.60 ³²	60.07 ⁴⁸
29.2	45.600 ¹⁰¹	44.67 ⁸⁹	18.541 ⁸⁷	34.75 ⁵⁷	52.794 ²³⁷	100.01 ⁸¹	39.30 ³⁰	59.12 ⁹⁵
July 9.2	45.512 ⁸⁸	43.62 ¹⁰⁵	18.468 ⁷³	35.28 ⁵³	52.588 ²⁰⁶	98.78 ¹²³	39.03 ²⁷	57.73 ¹³⁹
19.1	45.440 ⁷²	42.43 ¹¹⁹	18.409 ⁵⁹	35.76 ⁴⁸	52.417 ¹⁷¹	97.15 ¹⁶³	38.81 ²²	55.92 ¹⁸¹
29.1	45.385 ⁵⁵	41.16 ¹²⁷	18.368 ⁴¹	36.16 ⁴⁰	52.284 ¹³³	95.17 ¹⁹⁸	38.64 ¹⁷	53.74 ²¹⁸
Aug. 8.1	45.352 ³³	39.86 ¹³⁰	18.347 ²¹	36.46 ³⁰	52.195 ⁸⁹	92.88 ²²⁹	38.52 ¹²	51.23 ²⁵¹
18.1	45.342 ¹⁰	38.56 ¹³⁰	18.347 ⁰	36.62 ¹⁶	52.162 ⁴³	90.30 ²⁵⁸	38.45 ⁷	48.44 ²⁷⁹
28.0	45.361 ¹⁹	37.33 ¹²³	18.374 ²⁷	36.64 ²	52.168 ⁶	87.49 ²⁸¹	38.44 ¹	45.42 ³⁰²
Sept. 7.0	45.410 ⁴⁹	36.23 ¹¹⁰	18.428 ⁵⁴	36.47 ¹⁷	52.217 ⁵⁹	84.49 ³⁰⁰	38.49 ⁵	42.23 ³¹⁹
17.0	45.495 ⁸⁵	35.31 ⁹²	18.514 ⁸⁶	36.10 ³⁷	52.331 ¹¹⁴	81.37 ⁸¹²	38.61 ¹²	38.92 ³³¹
26.9	45.615 ¹²⁰	34.65 ⁶⁶	18.634 ¹²⁰	35.48 ⁶²	52.502 ¹⁷¹	78.18 ⁸¹⁹	38.80 ¹⁹	35.55 ³³⁷
Oct. 6.9	45.775 ¹⁶⁰	34.29 ³⁸	18.789 ¹⁵⁵	34.63 ⁸⁵	52.733 ²³¹	74.98 ³²⁰	39.05 ²⁵	32.20 ³³⁵
16.9	45.975 ²⁰⁰	34.26 ³	18.980 ¹⁹¹	33.52 ¹¹¹	53.021 ²⁸⁸	71.82 ⁸¹⁶	39.38 ³³	28.93 ³²⁷
26.9	46.211 ²³⁶	34.63 ³⁷	19.207 ²²⁷	32.16 ¹³⁶	53.366 ³⁴⁵	68.80 ³⁰²	39.77 ³⁹	25.82 ³¹¹
Nov. 5.8	46.483 ²⁷²	35.39 ⁷⁶	19.468 ²⁶¹	30.55 ¹⁶¹	53.764 ³⁹⁸	65.96 ²⁸⁴	40.22 ⁴⁵	22.92 ²⁹⁰
15.8	46.785 ³⁰²	36.55 ¹¹⁶	19.758 ²⁹⁰	28.74 ¹⁸¹	54.210 ⁴⁴⁶	63.39 ²⁵⁷	40.72 ⁵⁰	20.35 ²⁵⁷
25.8	47.110 ³²⁵	38.09 ¹⁵⁴	20.072 ³¹⁴	26.77 ¹⁹⁷	54.694 ⁴⁸⁴	61.17 ²²²	41.27 ⁵⁵	18.16 ²¹⁹
Dec. 5.8	47.448 ³³⁸	39.95 ¹⁸⁶	20.400 ³²⁸	24.67 ²¹⁰	55.202 ⁵⁰⁸	59.37 ¹⁸⁰	41.84 ⁵⁷	16.41 ¹⁷⁵
15.7	47.790 ³⁴²	42.11 ²¹⁶	20.733 ³³³	22.53 ²¹⁴	55.724 ⁵²²	58.03 ¹³⁴	42.43 ⁵⁹	15.17 ¹²⁴
25.7	48.126 ³³⁶	44.47 ²³⁶	21.062 ³²⁹	20.43 ²¹⁰	56.241 ⁵¹⁷	57.21 ⁸²	43.02 ⁵⁹	14.48 ⁶⁹
35.7	48.444 ³¹⁸	46.99 ²⁵²	21.376 ³¹⁴	18.40 ²⁰³	56.737 ⁴⁹⁶	56.93 ²⁸	43.58 ⁵⁶	14.36 ¹²
Mean Place	43.737	24.26	16.480	48.08	50.595	99.35	37.132	57.70
Sec δ , Tan δ	1.051	-0.322	1.003	+0.071	1.827	+1.529	2.144	+1.896
$D\psi\alpha$, $D\omega\alpha$	+0.06	-0.02	+0.06	0.00	+0.07	+0.10	+0.07	+0.12
$D\psi\delta$, $D\omega\delta$	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3	-0.4	+0.3

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Leonis. Mag. 4.7			ρ^4 Leonis. Mag. 5.7			ψ Ursae Majoris. Mag. 3.2			β Crateris. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 11 0	s + 7 46	"	h m 11 2	s + 2 23	"	h m 11 5	s + 44 56	"	h m 11 7	s - 22 22	"
Jan. 0.7	45.824	58.73	41.822	75.32	2.294	36.78	35.890	21.38				
10.7	46.130 ³⁰⁶	54.88 ¹⁸⁵	42.125 ³⁰³	73.29 ²⁰⁸	2.690 ³⁹⁶	36.29 ⁴⁹	36.206 ³¹⁶	24.02 ²⁶⁴				
20.6	46.406 ²⁷⁶	53.26 ¹⁶²	42.399 ²⁷⁴	71.43 ¹⁸⁶	3.051 ³⁶¹	36.30 ¹	36.491 ²⁸⁵	26.72 ²⁷⁰				
30.6	46.644 ²³⁸	51.88 ¹³⁸	42.636 ²³⁷	69.79 ¹⁶⁴	3.364 ³¹³	36.78 ⁴⁸	36.736 ²⁴⁵	29.41 ²⁶⁹				
Feb. 9.6	46.838 ¹⁹⁴	50.79 ¹⁰⁹	42.830 ¹⁹⁴	68.39 ¹⁴⁰	3.621 ²⁵⁷	37.71 ⁹³	36.936 ²⁰⁰	32.02 ²⁶¹				
	147	80	148	112	193	132	153	248				
19.5	46.985 ¹⁰¹	49.99 ⁵²	42.978 ¹⁰¹	67.27 ⁸⁷	3.814 ¹³⁰	39.03 ¹⁰⁴	37.089 ¹⁰⁵	34.50 ²³⁰				
Mar. 1.5	47.086 ⁵⁶	49.47 ²⁶	43.079 ⁵⁷	66.40 ⁵⁹	3.944 ⁶⁵	40.67 ¹⁸⁶	37.194 ⁵⁹	36.80 ²⁰⁶				
11.5	47.142 ¹⁴	49.21 ³	43.136 ¹⁶	65.81 ³⁵	4.009 ⁵	42.53 ¹⁹⁹	37.253 ¹⁸	38.86 ¹⁸²				
21.5	47.156 ²²	49.18 ¹⁹	43.152 ¹⁹	65.46 ¹³	4.014 ⁵⁰	44.52 ²⁰⁸	37.271 ²⁰	40.68 ¹⁵⁵				
31.4	47.134 ⁵⁸	49.37 ³⁸	43.133 ⁴⁹	65.33 ⁵	3.964 ⁹⁶	46.55 ¹⁹⁰	37.251 ⁴⁹	42.23 ¹²⁷				
Apr. 10.4	47.081 ⁷⁵	49.70 ⁴⁵	43.084 ⁷²	65.38 ²²	3.868 ¹³⁴	48.54 ¹⁸⁶	37.202 ⁷⁶	43.50 ⁹⁹				
20.4	47.006 ⁹¹	50.15 ⁵⁴	43.012 ⁸⁹	65.60 ³⁸	3.734 ¹⁶³	50.40 ¹⁶⁴	37.126 ⁹³	44.49 ⁷¹				
30.4	46.915 ¹⁰⁸	50.69 ⁵⁹	42.923 ¹⁰⁰	65.93 ⁴⁴	3.571 ¹⁸¹	52.04 ¹³⁸	37.033 ¹⁰⁷	45.20 ⁴³				
May 10.3	46.812 ¹⁰⁹	51.28 ⁶²	42.823 ¹⁰⁶	66.37 ⁵¹	3.390 ¹⁹²	53.42 ¹⁰⁶	36.926 ¹¹⁷	45.63 ¹⁴				
20.3	46.703 ¹⁰⁹	51.90 ⁶¹	42.717 ¹⁰⁷	66.88 ⁵⁵	3.198 ¹⁹⁵	54.48 ⁷¹	36.809 ¹²⁰	45.77 ¹³				
30.3	46.594 ¹⁰⁶	52.51 ⁵⁹	42.610 ¹⁰⁴	67.43 ⁵⁹	3.003 ¹⁹⁰	55.19 ³⁶	36.689 ¹¹⁸	45.64 ³⁹				
June 9.2	46.488 ⁹⁹	53.10 ⁵⁶	42.506 ⁹⁹	68.02 ⁶⁰	2.813 ¹⁸⁰	55.55 ¹	36.571 ¹¹⁶	45.25 ⁶³				
19.2	46.389 ⁸⁹	53.66 ⁵⁰	42.407 ⁸⁹	68.62 ⁶⁰	2.633 ¹⁶⁵	55.54 ⁴⁰	36.465 ¹⁰⁹	44.62 ⁸⁷				
29.2	46.300 ⁷⁷	54.16 ⁴²	42.318 ⁷⁷	69.22 ⁵⁸	2.468 ¹⁴³	55.14 ⁷⁶	36.346 ⁹⁸	43.75 ¹⁰⁶				
July 9.2	46.223 ⁶²	54.58 ³⁴	42.241 ⁶³	69.80 ⁵³	2.325 ¹²⁰	54.38 ¹¹¹	36.248 ⁸⁵	42.69 ¹²⁴				
19.1	46.161 ⁴⁶	54.92 ²³	42.178 ⁴⁷	70.33 ⁴⁶	2.205 ⁹⁶	53.27 ¹⁴³	36.163 ⁶⁸	41.45 ¹³⁵				
29.1	46.115 ²⁵	55.15 ¹¹	42.131 ²⁷	70.79 ³⁷	2.110 ⁶⁸	51.84 ¹⁷⁴	36.095 ⁴⁸	40.10 ¹⁴³				
Aug. 8.1	46.090 ⁴	55.26 ³	42.104 ⁶	71.16 ²⁶	2.047 ²⁹	50.10 ²⁰²	36.047 ²²	38.67 ¹⁴⁶				
18.1	46.086 ²²	55.23 ²⁰	42.098 ²⁰	71.42 ⁹	2.018 ⁷	48.08 ²²⁵	36.025 ⁴	37.21 ¹⁴³				
28.0	46.108 ⁴⁹	55.03 ⁴⁰	42.118 ⁴⁶	71.51 ⁷	2.025 ⁴⁵	45.83 ²⁴⁶	36.029 ³⁷	35.78 ¹³³				
Sept. 7.0	46.157 ⁸²	54.63 ⁵⁹	42.164 ⁷⁸	71.44 ²⁸	2.070 ⁸⁷	43.37 ²⁶⁵	36.066 ⁷³	34.45 ¹¹⁵				
17.0	46.239 ¹¹⁵	54.04 ⁸³	42.242 ¹¹³	71.16 ⁵⁰	2.157 ¹³³	40.72 ²⁷⁸	36.139 ¹¹²	33.30 ⁹³				
26.9	46.354 ¹⁵¹	53.21 ¹⁰⁷	42.355 ¹⁴⁹	70.66 ⁷⁷	2.280 ¹⁸⁰	37.94 ²⁸⁵	36.251 ¹⁵³	32.37 ⁶²				
Oct. 6.9	46.505 ¹⁸⁶	52.14 ¹³⁰	42.504 ¹⁸⁵	69.89 ¹⁰²	2.470 ²³⁷	35.09 ²⁸⁹	36.404 ¹⁹⁴	31.75 ²⁷				
16.9	46.691 ²²⁴	50.84 ¹⁵³	42.689 ²²¹	68.87 ¹³⁰	2.697 ²⁷⁴	32.20 ²⁸⁶	36.598 ²³⁴	31.48 ¹¹				
26.9	46.915 ²⁵⁹	49.31 ¹⁷⁵	42.910 ²⁵⁶	67.57 ¹⁵⁵	2.971 ³¹⁹	29.34 ²⁷⁷	36.832 ²⁷³	31.59 ⁵³				
Nov. 5.8	47.174 ²⁸⁸	47.56 ¹⁹¹	43.166 ²⁸⁶	66.02 ¹⁷⁶	3.290 ³⁵⁹	26.57 ²⁵⁹	37.105 ³⁰⁵	32.12 ⁹⁶				
15.8	47.462 ³¹²	45.65 ²⁰⁴	43.452 ³¹¹	64.26 ¹⁹⁵	3.649 ³⁹¹	23.98 ²³⁷	37.410 ³²⁹	33.08 ¹³⁷				
25.8	47.774 ³²⁸	43.61 ²¹³	43.763 ³²⁵	62.31 ²¹⁰	4.040 ⁴¹⁴	21.61 ²⁰⁵	37.739 ³⁴⁵	34.45 ¹⁷³				
Dec. 5.8	48.102 ³³⁵	41.48 ²¹¹	44.088 ³³⁸	60.21 ²¹⁵	4.454 ⁴²⁶	19.56 ¹⁶⁷	38.084 ³⁵¹	36.18 ²⁰⁸				
15.7	48.437 ³³²	39.37 ²⁰⁷	44.421 ³²⁹	58.06 ²¹⁵	4.880 ⁴²⁵	17.89 ¹²⁵	38.435 ³⁴⁶	38.26 ²³⁴				
25.7	48.769 ³¹⁶	37.30 ¹⁹⁴	44.750 ³¹⁵	55.91 ²⁰⁷	5.305 ⁴⁰⁹	16.64 ⁷⁸	38.781 ³³⁰	40.60 ²⁶⁴				
35.7	49.085	35.36	45.065	53.84	5.714	15.86	39.111	43.14				
Mean Place	44.205	66.38	40.246	83.26	0.238	56.81	34.425	21.40				
Sec δ , Tan δ	1.009	+0.137	1.001	+0.042	1.413	+0.998	1.081	-0.412				
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.06	0.00	+0.07	+0.06	+0.06	-0.03				
$D\psi\delta$, $D\omega\delta$	-0.4	+0.3	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Leonis. Mag. 2.6		θ Leonis. Mag. 3.4		γ Ursæ Majoris. Mag. 3.7		δ Crateris. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 9	° ' " +20 58	h m 11 9	° ' " +15 52	h m 11 13	° ' " +33 32	h m 11 15	° ' " -14 19
Jan. 0.7	43.491	29.04	54.783	47.89	61.774	33.07	12.819	47.82
10.7	43.818 ³²⁷	27.61 ¹⁴³	55.100 ³¹⁷	46.29 ¹⁶⁰	62.129 ³⁵⁵	32.08 ⁹⁹	13.182 ³¹³	50.27 ²⁴⁵
20.6	44.114 ²⁹⁶	26.52 ¹⁰⁹	55.390 ²⁹⁰	44.98 ¹³¹	62.455 ³²⁶	31.51 ⁵⁷	13.416 ²⁸⁴	52.71 ²⁴⁴
30.6	44.372 ²⁵⁸	25.78 ⁷⁴	55.642 ²⁵³	43.98 ¹⁰⁰	62.739 ²⁸⁴	31.38 ¹⁸	13.662 ²⁴⁶	55.09 ²³⁸
Feb. 9.6	44.586 ²¹⁴	25.40 ³⁸	55.851 ²⁰⁹	43.32 ⁶⁶	62.976 ²³⁷	31.67 ²⁹	13.866 ²⁰⁴	57.33 ²²⁴
19.6	44.751 ¹⁶⁵	25.35 ⁵	56.012 ¹⁶¹	42.98 ³⁴	63.159 ¹⁸⁸	32.35 ⁶⁸	14.025 ¹⁵⁹	59.38 ²⁰⁵
Mar. 1.5	44.867 ¹¹⁶	25.63 ²⁸	56.126 ¹¹⁴	42.94 ⁴	63.287 ¹²⁸	33.35 ¹⁰⁰	14.138 ¹¹³	61.23 ¹⁸⁵
11.5	44.935 ⁶⁸	26.17 ⁵⁴	56.192 ⁶⁶	43.18 ²⁴	63.361 ⁷⁴	34.63 ¹²⁸	14.206 ⁶⁸	62.83 ¹⁶⁰
21.5	44.957 ²²	26.94 ⁷⁷	56.215 ²⁸	43.64 ⁴⁶	63.384 ²³	36.08 ¹⁴⁵	14.234 ²⁸	64.19 ¹³⁶
31.4	44.939 ¹⁸	27.85 ⁹¹	56.200 ¹⁵	44.28 ⁶⁴	63.361 ²⁸	37.65 ¹⁵⁷	14.227 ⁷	65.29 ¹¹⁰
Apr. 10.4	44.889 ⁸⁰	28.86 ¹⁰¹	56.153 ⁴⁷	45.05 ⁷⁷	63.299 ⁶²	39.25 ¹⁸⁰	14.188 ⁸⁹	66.14 ⁸⁵
20.4	44.811 ⁷⁸	29.91 ¹⁰⁵	56.079 ⁷⁴	45.88 ⁸³	63.206 ⁹⁸	40.81 ¹⁵⁶	14.124 ⁶⁴	66.74 ⁶⁰
30.4	44.714 ⁹⁷	30.95 ¹⁰⁴	55.988 ⁹¹	46.74 ⁸⁶	63.087 ¹¹⁹	42.26 ¹⁴⁵	14.042 ⁸²	67.11 ³⁷
May 10.3	44.603 ¹¹¹	31.92 ⁹⁷	55.883 ¹⁰⁵	47.59 ⁸⁵	62.952 ¹³⁵	43.54 ¹²⁸	13.948 ⁹⁴	67.24 ¹³
20.3	44.484 ¹¹⁹	32.80 ⁸⁸	55.772 ¹¹¹	48.39 ⁸⁰	62.808 ¹⁴⁴	44.61 ¹⁰⁷	13.844 ¹⁰⁴	67.17 ⁷
30.3	44.363 ¹²¹	33.54 ⁷⁴	55.658 ¹¹⁴	49.09 ⁷⁰	62.660 ¹⁴⁶	45.43 ⁸³	13.786 ¹⁰⁸	66.89 ²⁸
June 9.3	44.246 ¹¹⁷	34.14 ⁸⁰	55.546 ¹¹²	49.70 ⁶¹	62.515 ¹⁴⁵	45.99 ⁵⁶	13.628 ¹⁰⁸	66.43 ⁴⁶
19.2	44.135 ¹¹¹	34.57 ⁴³	55.441 ¹⁰⁵	50.19 ⁴⁹	62.378 ¹³⁹	46.26 ²⁷	13.522 ¹⁰⁶	65.79 ⁶⁴
29.2	44.083 ¹⁰²	34.81 ²⁴	55.344 ⁹⁷	50.55 ³⁶	62.247 ¹²⁹	46.24 ²	13.423 ⁹⁰	65.01 ⁷⁸
July 9.2	43.943 ⁹⁰	34.87 ⁶	55.259 ⁸⁵	50.75 ²⁰	62.134 ¹¹³	45.92 ³²	13.332 ⁹¹	64.10 ⁹¹
19.1	43.870 ⁷³	34.72 ¹⁵	55.189 ⁷⁰	50.80 ⁵	62.038 ⁹⁶	45.31 ⁶¹	13.253 ⁷⁹	63.08 ¹⁰²
29.1	43.813 ⁵⁷	34.37 ³⁵	55.135 ⁵⁴	50.69 ¹¹	61.963 ⁷⁵	44.43 ⁸⁸	13.190 ⁶³	62.00 ¹⁰⁸
Aug. 8.1	43.776 ³⁷	33.83 ⁵⁴	55.100 ³⁵	50.39 ³⁰	61.910 ⁵³	43.27 ¹¹⁶	13.144 ⁴⁶	60.89 ¹¹¹
18.1	43.764 ¹²	33.06 ⁷⁷	55.088 ¹²	49.92 ⁴⁷	61.884 ²⁶	41.86 ¹⁴¹	13.121 ²³	59.80 ¹⁰⁹
28.0	43.778 ¹⁴	32.10 ⁹⁶	55.102 ¹⁴	49.24 ⁶⁸	61.887 ³	40.20 ¹⁶⁶	13.123 ²	58.78 ¹⁰²
Sept. 7.0	43.819 ⁴¹	30.91 ¹¹⁹	55.143 ⁴¹	48.36 ⁸⁸	61.923 ⁸⁶	38.32 ¹⁸⁸	13.155 ³²	57.88 ⁹⁰
17.0	43.894 ⁷⁵	29.53 ¹³⁸	55.217 ⁷⁴	47.26 ¹¹⁰	61.994 ⁷¹	36.23 ²⁰⁹	13.220 ⁶⁵	57.17 ⁷¹
27.0	44.004 ¹¹⁰	27.93 ¹⁶⁰	55.325 ¹⁰⁸	45.96 ¹³⁰	62.105 ¹¹¹	33.97 ²²⁶	13.322 ¹⁰²	56.68 ⁴⁹
Oct. 6.9	44.151 ¹⁴⁷	26.14 ¹⁷⁹	55.468 ¹⁴³	44.45 ¹⁵¹	62.256 ¹³¹	31.56 ²⁴¹	13.462 ¹⁴⁰	56.48 ²⁰
16.9	44.336 ¹⁸⁵	24.19 ¹⁸⁵	55.651 ¹⁸³	42.73 ¹⁷²	62.450 ¹⁹⁴	29.05 ²⁵¹	13.642 ¹⁸⁰	56.60 ¹²
26.9	44.561 ²²⁵	22.08 ²¹¹	55.871 ²²⁰	40.84 ¹⁸⁹	62.685 ²³⁵	26.47 ²⁵⁸	13.862 ²²⁰	57.06 ⁴⁶
Nov. 5.8	44.823 ²⁶²	19.87 ²²¹	56.127 ²⁵⁶	38.80 ²⁰⁴	62.961 ²⁷⁶	23.89 ²⁵⁸	14.119 ²⁵⁷	57.90 ⁸⁴
15.8	45.117 ²⁹⁴	17.60 ²²⁷	56.415 ²⁶³	36.65 ²¹⁵	63.274 ³¹³	21.36 ²⁸³	14.408 ²⁸⁹	59.10 ¹²⁰
25.8	45.438 ³²¹	15.34 ²³⁶	56.730 ³¹⁵	34.46 ²¹⁹	63.618 ³⁴⁴	18.96 ³⁴⁰	14.724 ³¹⁶	60.65 ¹⁵⁵
Dec. 5.8	45.777 ³³⁹	13.15 ²¹⁹	57.063 ³³³	32.28 ²¹³	63.983 ³⁶⁵	16.76 ²³⁰	15.057 ³³³	62.48 ¹⁸³
15.7	46.126 ³⁴⁰	11.10 ³⁰⁵	57.405 ³⁴³	30.19 ²⁰⁹	64.360 ³⁷⁷	14.81 ¹⁹⁵	15.397 ³⁴⁰	64.58 ²¹⁰
25.7	46.475 ³⁴⁹	9.23 ¹⁸⁷	57.746 ³⁴¹	28.23 ¹⁹⁶	64.738 ³⁷⁸	13.20 ¹⁶¹	15.735 ³³⁸	66.86 ²²⁸
35.7	46.811 ³³⁶	7.64 ¹⁸⁹	58.074 ³³⁸	26.49 ¹⁷⁴	65.104 ³⁶⁶	11.97 ¹²³	16.059 ³²⁴	69.25 ²³⁹
Mean Place	41.824	43.01	53.160	60.32	59.997	50.74	11.376	45.19
Sec δ , Tan δ	1.071	+0.383	1.040	+0.284	1.200	+0.663	1.032	-0.255
$D\psi\alpha$, $D_\alpha\alpha$	+0.06	+0.02	+0.06	+0.02	+0.06	+0.04	+0.06	-0.02
$D\psi\delta$, $D_\alpha\delta$	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2	-0.4	+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Leonis. Mag. 4.1			π Centauri. Mag. 4.3			ι Leonis. Mag. 4.0			τ Leonis. Mag. 5.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	11 16		+ 6 28	11 17		-54 2	11 19		+10 58	11 23		+ 3 18
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.7	52.979		54.51	14.455		0.98	37.419		60.56	41.618		40.02
10.7	53.291 ³¹²		52.59 ¹⁹²	14.890 ⁴³⁵		3.77 ²⁷⁹	37.737 ³¹⁸		58.76 ¹⁸⁰	41.932 ³¹⁴		37.99 ²⁰³
20.6	53.577 ²⁸⁹		50.87 ¹⁷²	15.279 ³⁸⁹		6.90 ³¹³	38.027 ²⁹⁰		57.22 ¹⁵⁴	42.221 ²⁸⁹		36.13 ¹⁸⁶
30.6	53.826 ²⁴⁹		49.39 ¹⁴⁸	15.610 ³²¹		10.27 ³³⁷	38.282 ²⁵⁵		55.96 ¹²⁶	42.474 ²⁵³		34.51 ¹⁶²
Feb. 9.6	54.034 ²⁰⁸		48.20 ¹¹⁹	15.680 ²⁷⁰		13.81 ³⁵⁴	38.495 ²¹³		54.99 ⁹⁷	42.667 ²¹³		33.13 ¹³⁸
19.6	54.197 ¹⁶⁸		47.29 ⁹¹	16.063 ²⁰⁸		17.40 ³⁵⁹	38.664 ¹⁶⁹		54.34 ⁶⁵	42.856 ¹⁶⁹		32.03 ¹¹⁰
Mar. 1.5	54.314 ¹¹⁷		46.68 ⁶¹	16.218 ¹³⁵		20.98 ²⁵⁸	38.785 ¹²¹		54.00 ³⁴	42.979 ¹²⁸		31.22 ⁸¹
11.5	54.387 ⁷³		46.34 ²⁴	16.288 ⁷⁰		24.45 ²⁴⁷	38.862 ⁷⁷		53.92 ⁸	43.059 ⁸⁰		30.67 ⁵⁵
21.5	54.418 ³¹		46.24 ¹⁰	16.298 ¹⁰		27.75 ²⁸⁰	38.896 ³⁴		54.10 ¹⁸	43.097 ³⁸		30.38 ²⁹
31.4	54.413 ⁵		46.36 ¹²	16.252 ⁴⁶		30.81 ³⁰⁶	38.893 ³		54.46 ³⁶	43.099 ²		30.30 ⁸
Apr. 10.4	54.376 ³⁷		46.64 ²⁸	16.156 ⁹⁶		33.58 ²⁷⁷	38.857 ³⁶		54.99 ⁵³	43.069 ³⁰		30.42 ¹²
20.4	54.314 ⁶²		47.06 ⁴²	16.019 ¹³⁷		36.01 ²⁴³	38.796 ⁶¹		55.63 ⁶⁴	43.015 ⁵⁴		30.71 ²⁹
30.4	54.283 ⁸¹		47.58 ⁵²	15.846 ¹⁷³		38.06 ²⁰⁵	38.715 ⁸¹		56.35 ⁷²	42.940 ⁷⁵		31.11 ⁴⁰
May 10.3	54.140 ⁹⁸		48.17 ⁵⁹	15.645 ²⁰¹		39.69 ¹⁶³	38.621 ⁹⁴		57.08 ⁷³	42.852 ⁸⁸		31.59 ⁴⁸
20.3	54.089 ¹⁰¹		48.79 ⁶²	15.424 ²²¹		40.88 ¹¹⁹	38.519 ¹⁰²		57.81 ⁷³	42.755 ⁹⁷		32.15 ⁵⁶
30.3	53.935 ¹⁰⁴		49.42 ⁶³	15.188 ²⁸⁶		41.61 ⁷³	38.412 ¹⁰⁷		58.50 ⁶⁹	42.654 ¹⁰¹		32.75 ⁶⁰
June 9.3	53.831 ¹⁰⁴		50.04 ⁶²	14.944 ²⁴⁴		41.87 ²⁶	38.305 ¹⁰⁷		59.14 ⁶⁴	42.552 ¹⁰²		33.36 ⁶¹
19.2	53.731 ¹⁰⁰		50.63 ⁵⁹	14.698 ²⁴⁶		41.66 ³¹	38.203 ¹⁰²		59.71 ⁵⁷	42.453 ⁹⁹		33.97 ⁶¹
29.2	53.638 ⁹³		51.17 ⁵⁴	14.458 ²⁴⁰		40.99 ⁶⁷	38.108 ⁹⁵		60.18 ⁴⁷	42.359 ⁹⁴		34.56 ⁵⁹
July 9.2	53.555 ⁸³		51.65 ⁴⁸	14.230 ²²⁸		39.87 ¹¹²	38.022 ⁸⁶		60.53 ³⁵	42.274 ⁸⁵		35.12 ⁵⁶
19.1	53.485 ⁵⁷		52.04 ³⁰	14.022 ¹⁸²		38.35 ¹⁸⁸	37.949 ⁵⁸		60.77 ¹¹	42.201 ⁶⁰		35.62 ⁴²
29.1	53.428 ³⁸		52.34 ¹⁷	13.840 ¹⁴⁷		36.47 ²¹⁹	37.891 ⁴⁰		60.88 ⁴	42.141 ⁴⁴		36.04 ³²
Aug. 8.1	53.390 ¹⁷		52.51 ⁴	13.693 ¹⁰⁵		34.28 ²⁴⁰	37.851 ¹⁹		60.84 ²²	42.097 ²³		36.36 ¹⁹
18.1	53.373 ⁵		52.55 ¹⁴	13.588 ⁵⁶		31.88 ²⁸⁶	37.832 ³		60.62 ³⁸	42.074 ⁰		36.55 ⁵
28.0	53.378 ³⁵		52.41 ³²	13.532 ¹		29.32 ²⁶¹	37.835 ³³		60.24 ⁵⁹	42.074 ²⁸		36.60 ¹⁴
Sept. 7.0	53.413 ⁶⁵		52.09 ⁵²	13.533 ⁶¹		26.71 ²⁶⁵	37.868 ⁶⁸		59.65 ⁸¹	42.102 ⁵⁹		38.46 ³⁴
17.0	53.478 ⁹⁸		51.57 ⁷⁶	13.594 ¹²⁶		24.16 ²⁴⁰	37.931 ⁹⁶		58.84 ¹⁰²	42.161 ⁹¹		36.12 ⁵⁶
27.0	53.576 ¹⁸⁶		50.81 ¹⁰⁰	13.720 ¹⁹⁶		21.76 ²¹⁴	38.027 ¹²⁴		57.82 ¹²⁶	42.252 ¹²⁹		35.56 ⁸²
Oct. 6.9	53.712 ¹⁷³		49.81 ¹²⁵	13.915 ²⁸⁰		19.62 ¹⁷⁹	38.161 ¹⁷²		56.56 ¹⁴⁸	42.381 ¹⁶⁷		34.74 ¹⁰⁸
16.9	53.865 ²¹¹		48.56 ¹⁴⁸	14.178 ³²⁵		17.83 ¹⁸⁴	38.333 ²¹⁰		55.08 ¹⁷⁰	42.548 ²⁰⁵		33.66 ¹³³
26.9	54.096 ²⁴⁸		47.08 ¹⁷¹	14.500 ³⁸¹		16.49 ⁸³	38.543 ²⁴⁷		53.38 ¹⁸⁷	42.753 ²⁴³		32.33 ¹⁵⁸
Nov. 5.8	54.344 ²⁷⁹		45.37 ¹⁸⁹	14.881 ⁴²⁹		15.66 ²⁶	38.790 ²⁷⁹		51.51 ²⁰³	42.996 ²⁷⁵		30.75 ¹⁷⁹
15.8	54.623 ³⁰⁷		43.48 ²⁰⁴	15.310 ⁴⁶⁴		15.40 ⁸³	39.069 ³⁰⁷		49.48 ²¹⁵	43.271 ³⁰³		28.96 ¹⁹⁷
25.8	54.930 ³²⁴		41.44 ²¹³	15.774 ⁴⁸⁵		15.73 ⁹⁸	39.376 ³²⁷		47.33 ²¹⁷	43.574 ³²³		26.99 ²¹¹
Dec. 5.8	55.254 ³⁸⁵		39.31 ²¹⁶	16.259 ⁴⁹¹		16.66 ¹⁵¹	39.703 ³⁸⁷		45.16 ²¹⁵	43.897 ³³³		24.88 ²¹⁶
15.7	55.589 ³³⁴		37.15 ²¹¹	16.750 ⁴⁸²		18.17 ²⁰⁴	40.040 ³³⁷		43.01 ²⁰⁶	44.230 ³³³		22.72 ²¹⁶
25.7	55.923 ³²²		35.04 ²⁰⁰	17.232 ⁴⁵⁵		20.21 ²⁵¹	40.377 ³²⁸		40.95 ¹⁹¹	44.563 ³²⁴		20.56 ²⁰⁷
35.7	56.245		33.04	17.687		22.72	40.705		39.04	44.887		18.49
Mean Place	51.460		64.09	12.999		9.66	35.891		71.67	40.156		48.67
Sec δ , Tan δ	1.006		+0.114	1.703		-1.378	1.019		+0.194	1.002		+0.058
$D\delta\alpha$, $D\alpha\alpha$	+0.06		+0.01	+0.05		-0.09	+0.06		+0.01	+0.06		0.00
$D\delta\delta$, $D\delta\delta$	-0.4		+0.2	-0.4		+0.2	-0.4		+0.2	-0.4		+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Draconis. Mag. 4.1		ξ Hydre. Mag. 3.7		λ Centauri. Mag. 3.3		ν Leonis. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 26	° ' " +69 46	h m 11 28	° ' " -31 23	h m 11 31	° ' " -62 33	h m 11 32	° ' " -0 21
	s	"	s	"	s	"	s	"
Jan. 0.7	32.52	56.70	56.346	51.29	58.05	27.40	43.336	62.91
10.7	33.24 72	56.84 14	56.690 344	53.93 264	58.59 54	29.97 257	43.654 318	65.03 212
20.6	33.91 67	57.58 74	57.004 314	56.73 280	59.07 43	32.95 298	43.945 291	67.02 199
30.6	34.50 59	58.89 131	57.279 275	59.62 299	59.49 42	36.25 330	44.203 258	68.82 180
Feb. 9.6	34.98 48	60.72 183	57.509 230	62.53 291	59.84 35	39.81 336	44.422 219	70.38 156
	38	226	181	284	27	368	176	132
19.6	35.36	62.98	57.690	65.37	60.11	43.49	44.598	71.70
Mar. 1.5	35.62	65.56 258	57.823 133	68.09 272	60.30 19	47.22 373	44.730 132	72.73 163
11.5	35.75 13	68.35 279	57.907 84	70.62 263	60.41 11	50.92 370	44.818 88	73.50 77
21.5	35.75 0	71.22 287	57.947 40	72.95 233	60.44 3	54.49 357	44.866 48	74.02 53
31.5	35.63 12	74.07 285	57.948 1	75.01 206	60.40 4	57.88 339	44.877 11	74.30 28
	21	270	35	180	11	314	21	8
Apr. 10.4	35.42	76.77	57.913	76.81	60.29	61.02	44.856	74.38
20.4	35.11 31	79.22 245	57.849 64	78.31 160	60.13 16	63.84 282	44.810 46	74.28 10
30.4	34.73 38	81.33 211	57.762 87	79.49 118	59.92 21	66.30 246	44.743 67	74.03 25
May 10.3	34.28 45	83.03 170	57.657 105	80.36 87	59.67 25	68.35 205	44.662 81	73.66 37
20.3	33.80 48	84.26 123	57.537 120	80.90 54	59.38 29	69.95 180	44.571 91	73.20 46
	50	74	128	21	31	112	97	54
30.3	33.30	85.00 21	57.409 133	81.11 11	59.07	71.07 62	44.474 100	72.66 58
June 9.3	32.80 50	85.21 81	57.276 134	81.00 43	58.74 33	71.69 12	44.374 99	72.08 62
19.2	32.30 48	84.90 83	57.142 131	80.57 74	58.40 34	71.81 38	44.275 95	71.46 64
29.2	31.82 43	84.07 133	57.011 123	79.83 101	58.07 33	71.43 88	44.180 88	70.82 63
July 9.2	31.39 39	82.74 179	56.888 113	78.82 127	57.74 31	70.55 134	44.092 79	70.19 60
19.2	31.00	80.95	56.775 99	77.55 147	57.43 27	69.21 175	44.013 65	69.59 56
29.1	30.66 34	78.73 222	56.676 78	76.08 165	57.16 23	67.46 214	43.948 51	69.03 48
Aug. 8.1	30.39 19	76.13 292	56.598 54	74.43 173	56.93 19	65.32 243	43.897 31	68.55 38
18.1	30.20 12	73.21 319	56.544 24	72.70 177	56.74 12	62.89 265	43.866 10	68.17 24
28.0	30.08 3	70.02 340	56.520 10	70.93 174	56.62 5	60.24 276	43.856 19	67.93 9
Sept. 7.0	30.05	66.62	56.530	69.19	56.57	57.48	43.875	67.84
17.0	30.10 5	63.07 355	56.578 48	67.57 162	56.60 3	54.69 279	43.923 48	67.95 11
27.0	30.24 14	59.44 363	56.670 92	66.14 143	56.73 13	51.99 270	44.006 83	68.30 35
Oct. 6.9	30.47 23	55.81 363	56.808 138	64.98 116	56.93 20	49.50 249	44.126 120	68.90 60
16.9	30.80 33	52.27 354	56.993 185	64.16 82	57.22 29	47.33 217	44.285 159	69.76 86
	43	341	231	42	37	177	199	115
26.9	31.23	48.86	57.224	63.74	57.59	45.56	44.484	70.91
Nov. 5.9	31.74 51	45.70 316	57.498 274	63.75 1	58.04 45	44.28 72	44.720 236	72.32 141
15.8	32.33 59	42.85 285	57.811 313	64.23 48	58.55 51	43.56 11	44.992 272	73.99 167
25.8	32.99 66	40.40 245	58.154 343	65.18 95	59.12 57	43.45 52	45.292 300	75.87 188
Dec. 5.8	33.70 71	38.43 197	58.517 363	66.57 139	59.70 58	43.97 112	45.612 320	77.91 204
	74	143	373	182	60	112	332	215
15.7	34.44	37.00	58.890	68.39	60.90	45.09	45.944	80.06
25.7	35.19 75	36.15 85	59.260 370	70.57 218	60.88 58	46.81 172	46.278 334	82.25 219
35.7	35.93 74	35.92 23	59.616 356	73.05 248	61.45 57	49.06 225	46.603 325	84.40 215
Mean Place	29.629	81.55	55.004	54.02	56.642	37.87	41.941	55.34
Sec δ , Tan δ	2.894	+2.716	1.172	-0.610	2.170	-1.926	1.000	-0.006
$D\psi\alpha$, $D\omega\alpha$	+0.07	+0.18	+0.06	-0.04	+0.05	-0.13	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Chamæleontis. Mag. 5.7		δ Draconis. Mag. 5.5		ζ Crateris. Mag. 4.9		χ Ursæ Majoris. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 33	° ' " -75 26	h m 11 37	° ' " +67 11	h m 11 40	° ' " -17 53	h m 11 41	° ' " +48 13
Jan. 0.7	51.35	1.09	53.86	50.55	34.527	22.95	42.205	60.65
10.7	52.25 ⁹⁰	3.45 ²⁸⁶	54.52 ⁶⁶	50.46 ⁹	34.856 ³²⁹	25.38 ²⁴³	42.636 ⁴³¹	59.90 ⁷⁵
20.7	53.06 ⁸¹	6.30 ²⁸⁵	55.13 ⁶¹	50.99 ⁵⁸	35.159 ³⁰⁸	27.86 ²⁴⁸	43.038 ⁴⁰²	59.70 ²⁰
30.6	53.76 ⁷⁰	9.54 ³²⁴	55.68 ⁵⁵	52.10 ¹¹¹	35.428 ²⁹⁹	30.32 ²⁴⁶	43.398 ³⁶⁰	60.03 ³³
Feb. 9.6	54.32 ⁵⁶	13.10 ³⁵⁶	56.14 ⁴⁶	53.74 ¹⁶⁴	35.657 ²²⁹	32.68 ²⁸⁶	43.706 ³⁰⁸	60.87 ⁸⁴
19.6	54.76 ⁴⁴	16.85 ⁸⁷⁵	56.51 ³⁷	55.84 ²¹⁰	35.844 ¹⁸⁷	34.91 ²²³	43.954 ²⁴⁸	62.17 ¹³⁰
Mar. 1.5	55.06 ²⁹	20.73 ³⁸⁸	56.77 ²⁶	58.29 ²⁴⁵	35.985 ¹⁴¹	36.94 ²⁰³	44.136 ¹⁸²	63.86 ¹⁶⁰
11.5	55.20 ¹⁵	24.63 ³⁹⁰	56.92 ¹⁵	60.99 ²⁷⁰	36.082 ⁹⁷	38.76 ¹⁸²	44.254 ¹¹⁸	65.83 ¹⁹⁷
21.5	55.21 ¹	28.47 ³⁸⁴	56.96 ⁴	63.81 ²⁸²	36.137 ⁵⁵	40.33 ¹⁵⁷	44.307 ⁵³	68.01 ²¹⁸
31.5	55.10 ¹¹	32.18 ³⁷¹	56.89 ⁷	66.65 ²⁸⁴	36.156 ¹⁹	41.67 ¹³⁴	44.299 ⁸	70.29 ²²⁸
Apr. 10.4	54.87 ²³	35.66 ³⁴⁸	56.73 ¹⁶	69.38 ²⁷³	36.141 ¹⁵	42.75 ¹⁰⁸	44.237 ⁶²	72.57 ²²⁸
20.4	54.51 ³⁶	38.85 ³¹⁹	56.48 ²⁵	71.89 ²⁶¹	36.100 ⁴¹	43.58 ⁸³	44.130 ¹⁰⁷	74.74 ²¹⁷
30.4	54.07 ⁴⁴	41.70 ²⁶⁵	56.17 ³¹	74.10 ²²¹	36.037 ⁶³	44.16 ⁵⁸	43.986 ¹⁴⁶	76.74 ²⁰⁰
May 10.4	53.53 ⁵⁴	44.13 ²⁴³	55.80 ³⁷	75.93 ¹⁸³	35.957 ⁸⁰	44.51 ³⁵	43.812 ¹⁷⁴	78.48 ¹⁷⁴
20.3	52.96 ⁵⁷	46.12 ¹⁹⁹	55.39 ⁴¹	77.32 ¹³⁹	35.865 ⁹²	44.62 ¹¹	43.619 ¹⁹³	79.92 ¹⁴⁴
30.3	52.31 ⁶⁵	47.61 ¹⁴⁹	54.96 ⁴³	78.23 ⁹¹	35.764 ¹⁰¹	44.51 ¹¹	43.414 ²⁰⁵	81.00 ¹⁰⁸
June 9.3	51.62 ⁶⁹	48.58 ⁹⁷	54.52 ⁴⁴	78.64 ⁴¹	35.658 ¹⁰⁶	44.19 ³²	43.204 ²¹⁰	81.69 ⁶⁹
19.2	50.91 ⁷¹	49.00 ⁴²	54.08 ⁴⁴	78.53 ¹¹	35.550 ¹⁰⁸	43.68 ⁵¹	42.996 ²⁰⁸	81.97 ²⁸
29.2	50.20 ⁷¹	48.88 ¹²	53.66 ⁴²	77.91 ⁶²	35.444 ¹⁰⁶	42.97 ⁷¹	42.795 ²⁰¹	81.84 ¹³
July 9.2	49.51 ⁶⁹	48.23 ⁶⁵	53.27 ³⁹	76.79 ¹¹²	35.342 ¹⁰²	42.12 ⁸⁵	42.608 ¹⁸⁷	81.30 ⁵⁴
19.2	48.86 ⁶⁵	47.05 ¹¹⁸	52.91 ³⁶	75.20 ¹⁵⁹	35.249 ⁹³	41.14 ⁹⁸	42.440 ¹⁶⁸	80.37 ⁹³
29.1	48.27 ⁵⁹	45.38 ¹⁶⁷	52.60 ³¹	73.17 ²⁰³	35.167 ⁸²	40.05 ¹⁰⁹	42.293 ¹⁴⁷	79.05 ¹³²
Aug. 8.1	47.76 ⁵¹	43.28 ²¹⁰	52.34 ²⁶	70.74 ²⁴³	35.101 ⁶⁶	38.90 ¹¹⁵	42.173 ¹²⁰	77.36 ¹⁶⁹
18.1	47.35 ⁴¹	40.82 ²⁴⁶	52.14 ²⁰	67.98 ²⁷⁶	35.054 ⁴⁷	37.73 ¹¹⁷	42.085 ⁸⁸	75.34 ²⁰²
28.1	47.07 ²⁸	38.08 ²⁷⁴	52.02 ¹²	64.92 ³⁰⁶	35.032 ²²	36.59 ¹¹⁴	42.031 ⁵⁴	73.04 ²³⁰
Sept. 7.0	46.92 ¹⁵	35.15 ²⁹³	51.96 ⁶	61.62 ³³⁰	35.038 ⁶	35.54 ¹⁰⁵	42.017 ¹⁴	70.46 ²⁵⁸
17.0	46.91 ¹	32.14 ³⁰¹	51.98 ²	58.14 ³⁴⁸	35.078 ⁴⁰	34.63 ⁹¹	42.047 ³⁰	67.68 ²⁷⁸
27.0	47.08 ¹⁷	29.17 ²⁹⁷	52.08 ¹⁰	54.57 ³⁵⁷	35.155 ⁷⁷	33.94 ⁶⁹	42.125 ⁷⁸	64.72 ²⁹⁶
Oct. 6.9	47.40 ³²	26.35 ²⁸²	52.27 ¹⁹	50.95 ³⁶²	35.272 ¹¹⁷	33.50 ⁴⁴	42.253 ¹²⁸	61.62 ³¹⁰
16.9	47.87 ⁴⁷	23.80 ³⁵⁵	52.54 ²⁷	47.37 ³⁵⁸	35.432 ¹⁶⁰	33.37 ¹³	42.435 ¹⁸²	58.47 ³¹⁵
26.9	48.50 ⁶³	21.64 ²¹⁶	52.89 ³⁵	43.92 ³⁴⁵	35.634 ²⁰²	33.59 ²²	42.671 ²³⁶	55.32 ³¹⁵
Nov. 5.9	49.25 ⁷⁵	19.96 ¹⁶⁸	53.34 ⁴⁵	40.65 ³²⁷	35.876 ²⁴²	34.17 ⁵⁸	42.959 ²⁸⁸	52.25 ³⁰⁷
15.8	50.11 ⁸⁶	18.83 ¹¹³	53.85 ⁵¹	37.68 ²⁹⁷	36.155 ²⁷⁹	35.12 ⁹⁵	43.296 ³³⁷	49.32 ²⁹³
25.8	51.05 ⁹⁴	18.32 ⁵¹	54.43 ⁵¹	35.09 ²⁵⁹	36.466 ³¹¹	36.44 ¹³²	43.674 ³⁷⁸	46.63 ²⁶⁹
Dec. 5.8	52.04 ⁹⁹	18.45 ¹³	55.06 ⁶³	32.93 ²¹⁶	36.798 ³³²	38.10 ¹⁶⁶	44.086 ⁴¹²	44.24 ²³⁹
15.8	53.05 ¹⁰¹	19.23 ⁷⁸	55.73 ⁶⁷	31.29 ¹⁶⁴	37.143 ³⁴⁵	40.05 ¹⁹⁵	44.520 ⁴³⁴	42.24 ²⁰⁰
25.7	54.05 ¹⁰⁰	20.65 ¹⁴²	56.41 ⁶⁸	30.23 ¹⁰⁶	37.488 ³⁴⁵	42.25 ²²⁰	44.963 ⁴⁴³	40.68 ¹⁵⁶
35.7	54.99 ⁹⁴	22.66 ²⁰¹	57.08 ⁶⁷	29.77 ⁴⁶	37.827 ³³⁹	44.60 ²³⁵	45.400 ⁴³⁷	39.63 ¹⁰⁵
Mean Place	49.733	13.46	51.393	75.59	33.229	21.29	40.449	82.74
Sec δ , Tan δ	3.978	-3.850	2.580	+2.379	1.051	-0.323	1.501	+1.120
$D_{\phi} \alpha$, $D_{\phi} \alpha$	+0.05	-0.25	+0.07	+0.16	+0.06	-0.02	+0.06	+0.07
$D_{\phi} \delta$, $D_{\phi} \delta$	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1	-0.4	+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Leonis. (Denebola.) Mag. 2.2			β Virginis. Mag. 3.8			Groombridge 1880. Mag. 6.5			γ Ursae Majoris. Mag. 2.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 11 44	s	° ' " +15 1	h m 11 46	s	° ' " +2 13	h m 11 48	s	° ' " +38 18	h m 11 49	s	° ' " +54 8
Jan. 0.7	51.049		56.95	23.638		48.49	13.562		32.15	30.139		58.97
10.7	51.378	320	55.18	23.962	324	46.41	13.954	302	30.87	30.617	478	58.33
20.7	51.684	306	53.69	24.262	300	44.48	14.323	300	30.07	31.065	448	58.26
30.6	51.959	275	52.53	24.532	270	42.78	14.656	283	29.77	31.470	405	58.77
Feb. 9.6	52.196	287	51.72	24.765	233	41.31	14.945	289	29.94	31.819	349	59.81
19.6	52.388	192	51.24	24.955	190	40.13	15.182	237	30.55	32.102	283	61.32
Mar. 1.6	52.535	147	51.11	25.101	146	39.22	15.363	181	31.56	32.315	213	63.28
11.5	52.636	101	51.28	25.205	104	38.60	15.489	126	32.88	32.452	137	65.45
21.5	52.695	59	51.69	25.268	63	38.23	15.561	72	34.45	32.517	65	67.86
31.5	52.713	18	52.33	25.293	25	38.11	15.583	22	36.17	32.511	6	70.36
Apr. 10.4	52.698	15	53.12	25.287	6	38.18	15.559	24	37.94	32.444	67	72.86
20.4	52.655	43	54.02	25.253	24	38.42	15.496	68	39.68	32.322	122	75.24
30.4	52.587	68	54.96	25.198	55	38.79	15.403	98	41.32	32.156	167	77.40
May 10.4	52.503	84	55.91	25.126	72	39.27	15.285	118	42.79	31.952	203	79.30
20.3	52.407	96	56.82	25.042	84	39.82	15.150	135	44.03	31.724	228	80.84
30.3	52.303	104	57.67	24.950	92	40.41	15.004	146	45.00	31.479	245	81.98
June 9.3	52.195	108	58.41	24.854	96	41.03	14.853	151	45.65	31.226	253	82.70
19.3	52.087	106	59.03	24.757	97	41.65	14.703	150	45.97	31.073	32	82.97
29.2	51.982	105	59.52	24.661	96	42.26	14.557	146	45.96	30.973	1	82.79
July 9.2	51.883	99	59.85	24.570	91	42.84	14.426	137	45.59	30.727	246	82.17
19.2	51.793	79	60.01	24.487	88	43.36	14.297	128	44.87	30.495	232	82.17
29.1	51.714	62	60.00	24.415	72	43.81	14.189	108	43.82	30.283	212	81.10
Aug. 8.1	51.652	46	59.80	24.356	59	44.17	14.102	87	42.44	30.094	189	79.62
18.1	51.607	21	59.41	24.314	42	44.40	14.040	62	40.74	29.937	157	77.77
28.1	51.586	4	58.80	24.295	19	44.50	14.007	38	38.75	29.816	121	75.55
Sept. 7.0	51.590		57.98	24.301		44.42	14.005		36.51	29.734	82	73.01
17.0	51.625	35	56.94	24.338	27	44.14	14.041	36	34.02	29.816	38	70.22
27.0	51.694	69	55.66	24.409	71	43.63	14.117	76	31.35	29.696	224	70.22
Oct. 7.0	51.801	107	54.17	24.516	107	42.87	14.237	130	28.50	29.708	249	67.19
16.9	51.948	147	52.45	24.664	148	41.86	14.404	167	25.53	29.774	267	63.99
26.9	52.135	187	50.55	24.851	187	40.57	14.618	214	22.50	29.897	285	60.68
Nov. 5.9	52.362	227	48.46	25.078	227	39.05	14.879	261	19.46	30.081	303	57.33
15.8	52.627	265	46.26	25.341	263	37.29	15.183	304	16.47	30.325	303	54.01
25.8	52.924	297	43.98	25.636	296	35.35	15.526	343	13.63	30.628	303	50.78
Dec. 5.8	53.244	336	41.70	25.953	317	33.25	15.898	372	11.02	30.987	359	47.74
15.8	53.580		39.47	26.285		31.07	16.293		8.69	31.395	408	44.95
25.7	53.921	341	37.37	26.621	336	28.89	16.696	408	6.72	31.842	447	42.52
35.7	54.256	335	35.47	26.951	330	26.75	17.092	486	5.18	32.315	487	40.52
Mean Place	49.653		69.92	22.311		57.16	12.010		52.10	32.802	484	39.00
Sec δ , Tan δ	1.035		+0.268	1.001		+0.039	1.274		+0.790	33.286		38.04
$D\phi\alpha$, $D\omega\alpha$	+0.06		+0.02	+0.06		0.00	+0.06		+0.05			
$D\phi\delta$, $D\omega\delta$	-0.4		+0.1	-0.4		+0.1	-0.4		+0.1			0.0

APPARENT PLACES OF STARS, 1917.

413

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Virginis. Mag. 4.6			\circ Virginis. Mag. 4.2			δ Centauri. Mag. 2.9			ϵ Corvi. Mag. 3.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 11 56	s + 7 4	° ' "	h m 12 0	s + 9 11	° ' "	h m 12 4	s -50 15	° ' "	h m 12 5	s -22 9	° ' "
Jan. 0.7	38.464	27.24	60.174	26.68	4.108	29.24	52.358	30.00				
10.7	38.792 ³²³	25.24 ³⁰⁰	60.504 ³³⁰	24.72 ¹⁹⁶	4.555 ⁴⁴⁷	31.57 ²³³	52.702 ³⁴⁴	32.36 ²³⁶				
20.7	39.098 ³⁰⁶	23.46 ¹⁷⁸	60.812 ³⁰⁸	23.00 ¹⁷²	4.971 ⁴¹⁶	34.27 ²⁷⁰	53.025 ³²³	34.81 ²⁴⁵				
30.6	39.376 ²⁷⁸	21.94 ¹⁵²	61.093 ²⁸¹	21.55 ¹⁴⁵	5.345 ³⁷⁴	37.25 ²⁹⁸	53.317 ²⁹²	37.30 ²⁴⁹				
Feb. 9.6	39.616 ²⁴⁰	20.70 ¹²⁴	61.337 ²⁴⁴	20.41 ¹¹⁴	5.668 ³²³	40.42 ³¹⁷	53.571 ²⁶⁴	39.76 ²⁴⁶				
	190	94	204	82	268	328	213	235				
19.6	39.815	19.76	61.541	19.59	5.936	43.70	53.784	42.11				
Mar. 1.6	39.971 ¹⁵⁶	19.14 ⁶²	61.701 ¹⁶⁰	19.10 ⁴⁹	6.146 ²¹⁰	47.02 ³³²	53.954 ¹⁷⁰	44.33 ²²²				
	114	32	117	21	150	328	126	202				
11.5	40.085 ⁷²	18.82 ⁶	61.818 ⁷⁶	18.89 ⁷	6.296 ⁹⁵	50.30 ³¹⁷	54.080 ⁸⁵	46.35 ¹⁸⁰				
21.5	40.157 ³³	18.76 ¹⁸	61.894 ³⁷	18.96 ³²	6.391 ⁴³	53.47 ²⁹⁹	54.165 ⁴⁷	48.15 ¹⁵⁹				
31.5	40.190 ¹	18.94 ³⁶	61.931 ⁴	19.28 ⁴⁹	6.434 ⁶	56.46 ²⁷⁸	54.212 ¹²	49.74 ¹³⁴				
Apr. 10.5	40.191	19.30	61.935	19.77	6.428	59.24	54.224	51.08				
20.4	40.162 ²⁹	19.82 ⁵²	61.909 ²⁶	20.40 ⁶³	6.379 ⁴⁹	61.74 ²⁵⁰	54.206 ¹⁸	52.17 ¹⁰⁹				
30.4	40.112 ⁵⁰	20.45 ⁶³	61.861 ⁴⁸	21.15 ⁷⁵	6.291 ⁸⁸	63.94 ²²⁰	54.164 ⁴²	53.02 ⁸⁵				
May 10.4	40.043 ⁶⁹	21.15 ⁷⁰	61.793 ⁶⁸	21.94 ⁷⁹	6.170 ¹²¹	65.78 ¹⁸⁴	54.101 ⁶³	53.61 ⁵⁹				
20.3	39.960 ⁸³	21.87 ⁷²	61.711 ⁸²	22.75 ⁸¹	6.022 ¹⁴⁸	67.23 ¹⁴⁵	54.021 ⁸⁰	53.96 ³⁵				
	92	74	92	79	172	106	92	11				
30.3	39.868	22.61	61.619	23.54	5.850	68.29	53.929	54.07				
June 9.3	39.771 ⁹⁷	23.31 ⁷⁰	61.521 ⁹⁸	24.29 ⁷⁵	5.661 ¹⁸⁹	68.93 ⁶⁴	53.826 ¹⁰⁸	53.95 ¹²				
19.3	39.671 ¹⁰⁰	23.97 ⁶⁶	61.420 ¹⁰¹	24.96 ⁶⁷	5.459 ²⁰²	69.13 ²⁰	53.717 ¹⁰⁹	53.59 ³⁶				
29.2	39.571 ¹⁰⁰	24.57 ⁶⁰	61.318 ¹⁰²	25.55 ⁵⁹	5.250 ²⁰⁹	68.89 ²⁴	53.605 ¹¹²	53.02 ⁵⁷				
July 9.2	39.475 ⁹⁶	25.08 ⁵¹	61.219 ⁹³	26.04 ⁴⁹	5.041 ²⁰⁹	68.23 ⁶⁶	53.493 ¹⁰⁸	52.25 ⁷⁷				
	90	42	93	37	204	106	108	94				
19.2	39.385	25.50	61.126	26.41	4.837	67.17	53.385	51.31				
29.2	39.305 ⁸⁰	25.80 ³⁰	61.042 ⁸⁴	26.64 ²³	4.647 ¹⁹⁰	65.75 ¹⁴²	53.284 ¹⁰¹	50.23 ¹⁰⁸				
Aug. 8.1	39.239 ⁶⁶	25.95 ¹⁵	60.971 ⁷¹	26.73 ⁹	4.478 ¹⁶⁹	63.98 ¹⁷⁷	53.195 ⁸⁹	49.03 ¹²⁰				
18.1	39.188 ⁵¹	25.96 ¹	60.916 ⁵⁵	26.65 ⁸	4.337 ¹⁴¹	61.94 ²⁰⁴	53.125 ⁷⁹	47.79 ¹²⁴				
28.1	39.158 ³⁰	25.79 ¹⁷	60.882 ³⁴	26.37 ²⁸	4.234 ¹⁰³	59.72 ²²²	53.076 ⁴⁹	46.52 ¹²⁷				
	5	35	11	47	58	235	21	121				
Sept. 7.0	39.153	25.44	60.871	25.90	4.176	57.37	53.055	45.31				
17.0	39.178 ²⁵	24.88 ⁵⁶	60.891 ³⁰	25.21 ⁶⁰	4.171 ⁵	54.99 ²³⁸	53.068 ¹³	44.19 ¹¹²				
27.0	39.236 ⁵⁸	24.09 ⁷⁹	60.944 ⁵³	24.30 ⁹¹	4.225 ⁵⁴	52.68 ²³¹	53.119 ⁵¹	43.23 ⁹⁶				
Oct. 7.0	39.331 ⁹⁵	23.06 ¹⁰³	61.034 ⁹⁰	23.14 ¹¹⁶	4.342 ¹¹⁷	50.54 ²¹⁴	53.212 ⁹⁸	42.51 ⁷²				
16.9	39.467 ¹³⁶	21.77 ¹²⁹	61.165 ¹³¹	21.75 ¹³⁹	4.525 ¹⁸³	48.66 ¹⁸⁸	53.350 ¹³⁸	42.06 ⁴⁵				
	176	151	172	163	247	152	184	10				
26.9	39.643	20.26	61.337	20.12	4.772	47.14	53.534	41.96				
Nov. 5.9	39.859 ²¹⁶	18.52 ¹⁷⁴	61.550 ²¹³	18.28 ¹⁸⁴	5.081 ³⁰⁹	46.05 ¹⁰⁹	53.763 ²²⁹	42.22 ²⁶				
15.9	40.114 ²⁶⁵	16.59 ¹⁹³	61.802 ²⁵²	16.27 ²⁰¹	5.446 ³⁶⁵	45.46 ⁵⁹	54.033 ²⁷⁰	42.87 ⁶⁵				
25.8	40.400 ²⁸⁶	14.50 ²⁰⁹	62.086 ²⁸⁴	14.11 ²¹⁶	5.856 ⁴¹⁰	45.40 ⁶	54.338 ³⁰⁵	43.91 ¹⁰⁴				
Dec. 5.8	40.713 ³¹³	12.32 ²¹⁸	62.398 ³¹²	11.89 ²²²	6.300 ⁴⁴⁴	45.90 ⁵⁰	54.670 ³¹²	45.30 ¹³⁹				
	329	221	329	223	463	106	350	174				
15.8	41.042	10.11	62.727	9.66	6.763	46.95	55.020	47.04				
25.7	41.378 ³³⁶	7.94 ²¹⁷	63.063 ³³⁶	7.48 ²¹⁸	7.232 ⁴⁶⁹	48.52 ¹⁵⁷	55.375 ³⁵⁵	49.06 ²⁰²				
35.7	41.711 ³³³	5.87 ²⁰⁷	63.396 ³³³	5.44 ²⁰⁴	7.689 ⁴⁵⁷	50.56 ²⁰⁴	55.725 ³⁵⁰	51.30 ²²⁴				
Mean Place	37.180	37.72	58.908	37.95	2.987	37.19	51.206	29.59				
Sec δ , Tan δ	1.008	+0.124	1.013	+0.162	1.564	-1.203	1.080	-0.407				
$D\alpha$, D_{α}	+0.06	+0.01	+0.06	+0.01	+0.06	-0.08	+0.06	-0.03				
$D\delta$, D_{δ}	-0.4	0.0	-0.4	0.0	-0.4	0.0	-0.4	0.0				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 H. Draconis. Mag. 5.1		δ Crucis. Mag. 3.1		δ Ursæ Majoris. Mag. 3.4		γ Corvi. Mag. 2.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 8	° ' " +78 3	h m 12 10	° ' " -58 17	h m 12 11	° ' " +57 28	h m 12 11	° ' " -17 4
	s	"	s	"	s	"	s	"
Jan. 0.7	22.32	71.91 19	45.128	5.58 216	21.183	72.89 80	33.234	54.01 230
10.7	23.48 116	71.72 48	45.653 525	7.74 216	21.698 515	72.09 19	33.573 319	56.31 235
20.7	24.58 110	72.20 48	46.142 489	10.34 260	22.189 491	71.90 40	33.892 290	58.66 234
30.6	25.59 101	73.30 110	46.585 443	13.28 294	22.641 398	72.30 99	34.182 255	61.00 225
Feb. 9.6	26.48 99	74.97 167	46.969 384	16.49 321	23.039 332	73.29 149	34.437 214	63.25 212
19.6	27.22 74	77.14 217	47.290 321	19.88 339	23.371 269	74.78 193	34.651 173	65.37 195
Mar. 1.6	27.77 55	79.73 259	47.543 263	23.36 348	23.630 181	76.71 228	34.824 130	67.32 174
11.5	28.13 36	82.59 286	47.727 184	26.86 850	23.811 102	78.99 263	34.954 90	69.06 152
21.5	28.28 15	85.63 304	47.845 118	30.29 343	23.913 27	81.52 265	35.044 52	70.58 128
31.5	28.23 5	88.69 306	47.899 54	33.60 331	23.940 45	84.17 267	35.096 19	71.86 105
Apr. 10.5	27.98 25	91.69 300	47.892 7	36.70 310	23.895 107	86.84 267	35.115 11	72.91 82
20.4	27.57 41	94.49 280	47.832 60	39.56 286	23.788 107	89.41 267	35.104 11	73.73 82
30.4	27.01 56	96.99 250	47.724 108	42.10 254	23.626 162	91.81 240	35.069 35	74.31 58
May 10.4	26.31 70	99.10 211	47.573 151	44.29 219	23.421 205	93.93 212	35.013 56	74.68 37
20.3	25.51 80	100.76 80	47.384 189	46.10 181	23.180 241	95.70 177	34.940 73	74.82 14
30.3	24.64 87	101.92 116	47.164 220	47.47 137	22.914 266	97.09 139	34.855 85	74.77 5
June 9.3	23.73 91	102.54 62	46.919 245	48.42 95	22.638 281	98.03 94	34.760 95	74.54 23
19.3	22.79 94	102.61 7	46.656 263	48.87 45	22.345 288	98.51 48	34.658 102	74.12 42
29.2	21.87 92	102.11 50	46.381 275	48.85 2	22.058 287	98.51 0	34.553 105	73.54 58
July 9.2	20.98 89	101.09 102	46.105 276	48.38 47	21.780 278	98.04 47	34.447 106	72.81 73
19.2	20.14 84	99.55 154	45.833 272	47.44 94	21.518 262	97.10 94	34.343 104	71.96 85
29.2	19.38 76	97.52 203	45.577 256	46.07 137	21.278 240	95.71 139	34.247 96	71.01 95
Aug. 8.1	18.70 68	95.05 247	45.345 232	44.31 176	21.067 211	93.90 181	34.161 86	69.99 102
18.1	18.12 58	92.21 284	45.148 197	42.22 209	20.891 176	91.70 220	34.091 70	68.94 105
28.1	17.67 45	89.02 319	44.999 149	39.87 235	20.756 135	89.15 255	34.042 49	67.91 108
Sept. 7.0	17.36 31	85.57 345	44.905 94	37.35 252	20.667 89	86.31 284	34.019 23	66.96 95
17.0	17.18 18	81.92 365	44.874 31	34.73 262	20.631 36	83.21 310	34.027 8	66.11 85
27.0	17.15 3	78.15 377	44.916 42	32.15 258	20.652 21	79.91 330	34.071 44	65.45 66
Oct. 7.0	17.28 13	74.32 383	45.035 119	29.68 247	20.736 84	76.48 343	34.157 86	65.01 44
16.9	17.57 45	70.52 380	45.235 200	27.45 223	20.886 150	72.98 350	34.285 128	64.86 15
26.9	18.02 45	66.82 870	45.513 278	25.55 190	21.103 217	69.48 360	34.458 173	65.02 16
Nov. 5.9	18.64 62	63.34 348	45.866 353	24.08 147	21.387 284	66.06 342	34.676 218	65.51 49
15.9	19.40 76	60.15 319	46.286 420	23.09 99	21.735 348	62.82 324	34.935 259	66.38 87
25.8	20.29 89	57.33 282	46.762 476	22.67 42	22.141 406	59.85 297	35.229 294	67.58 120
Dec. 5.8	21.30 101	54.99 284	47.278 516	22.82 15	22.596 455	57.22 263	35.550 321	69.11 153
15.8	22.41 111	53.18 181	47.819 541	23.56 74	23.087 491	55.02 220	35.888 338	70.93 182
25.7	23.55 114	51.97 121	48.367 548	24.87 131	23.599 512	53.33 169	36.236 348	72.98 205
35.7	24.72 117	51.39 58	48.904 537	26.71 184	24.116 517	52.18 115	36.579 343	75.19 221
Mean Place	19.650	98.71	44.064	15.32	19.618	97.50	32.104	51.83
Sec δ , Tan δ	4.838	+4.734	1.903	-1.619	1.861	+1.569	1.046	-0.307
$D\psi\alpha$, $D_m\alpha$	+0.06	+0.32	+0.06	-0.11	+0.06	+0.10	+0.06	-0.02
$D\psi\delta$, $D_m\delta$	-0.4	0.0	-0.4	0.0	-0.4	0.0	-0.4	-0.1

APPARENT PLACES OF STARS, 1917.

415

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Canum Venat. Mag. 5.8			β Chamaeleontis. Mag. 4.4			γ Virginis. Mag. 4.0			α^1 Crucis. Mag. 1.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 12 11	s	° ' "	h m 12 13	s	° ' "	h m 12 15	s	° ' "	h m 12 21	s	° ' "
Jan. 0.7	59.715		58.12	27.81		52.05	40.716		28.48	59.13		10.85
10.7	60.114	399	58.86	29.05	124	53.82	41.046	330	30.60	59.73	60	12.81
20.7	60.494	380	58.11	30.21	116	56.13	41.358	312	32.61	60.29	56	15.24
30.7	60.842	348	55.89	31.26	105	58.91	41.644	286	34.43	60.80	51	18.05
Feb. 9.6	61.150	308	56.18	32.15	89	62.09	41.896	262	36.01	61.25	45	21.19
19.6	61.409	269	56.96	32.90	75	65.58	42.109	213	37.33	61.62	37	24.55
Mar. 1.6	61.614	205	58.17	33.48	58	69.27	42.282	173	38.37	61.93	31	28.06
11.5	61.762	148	59.74	33.88	40	73.09	42.413	131	39.13	62.16	23	31.61
21.5	61.854	92	61.67	34.12	24	76.94	42.505	92	39.64	62.31	15	35.14
31.5	61.895	41	63.60	34.18	6	80.75	42.559	54	39.89	62.39	8	38.59
Apr. 10.5	61.886	9	65.73	34.08	10	84.44	42.580	21	39.93	62.40	1	41.87
20.4	61.834	82	67.83	33.83	25	87.91	42.573	7	39.79	62.35	5	44.92
30.4	61.746	88	69.87	33.42	41	91.13	42.540	33	39.48	62.24	11	47.69
May 10.4	61.628	118	71.73	32.89	53	94.01	42.488	52	39.07	62.08	16	50.12
20.4	61.488	140	73.36	32.24	65	96.47	42.420	68	38.56	61.86	22	52.16
30.3	61.332	166	74.71	31.49	75	98.49	42.341	79	37.98	61.62	24	53.79
June 9.3	61.164	168	75.73	30.65	84	100.04	42.252	89	37.37	61.34	28	54.96
19.3	60.991	173	76.40	29.76	89	101.04	42.157	95	36.73	61.03	31	55.66
29.2	60.820	171	76.70	28.83	93	101.50	42.059	98	36.09	60.70	33	55.86
July 9.2	60.655	165	76.63	27.89	94	101.41	41.961	98	35.47	60.37	33	55.57
19.2	60.496	159	76.17	26.97	92	100.77	41.866	95	34.88	60.04	33	54.80
29.2	60.352	144	75.34	26.10	87	99.60	41.776	90	34.35	59.73	31	53.56
Aug. 8.1	60.226	126	74.15	25.32	78	97.93	41.697	79	33.90	59.44	29	51.90
18.1	60.120	106	72.61	24.63	69	95.82	41.632	65	33.55	59.18	26	49.88
28.1	60.043	77	70.75	24.08	55	93.34	41.584	48	33.34	58.99	19	47.55
Sept. 7.1	59.996	47	68.60	23.71	37	90.57	41.563	21	33.28	58.86	13	44.98
17.0	59.967	9	66.18	23.51	20	87.61	41.569	6	33.40	58.79	7	42.30
27.0	60.020	33	63.53	23.51	0	84.58	41.608	39	33.75	58.81	2	39.59
Oct. 7.0	60.099	79	60.70	23.73	22	81.58	41.686	78	34.33	58.91	10	36.97
16.9	60.226	127	57.72	24.16	43	78.74	41.804	118	35.17	59.11	20	34.53
26.9	60.405	179	54.86	24.80	64	76.18	41.964	160	36.28	59.40	29	32.40
Nov. 5.9	60.634	229	51.61	25.60	80	74.01	42.168	204	37.65	59.78	38	30.66
15.9	60.912	278	48.60	26.61	101	72.32	42.411	243	39.28	60.23	45	29.40
25.8	61.233	321	45.72	27.75	114	71.19	42.687	276	41.11	60.75	52	28.69
Dec. 5.8	61.592	359	43.07	28.98	123	70.68	42.992	305	43.12	61.32	57	28.55
15.8	61.976	384	40.71	30.26	128	70.79	43.317	325	45.25	61.92	60	29.02
25.8	62.376	400	38.74	31.56	130	71.55	43.651	334	47.43	62.54	62	30.08
35.7	62.778	402	37.20	32.84	128	72.93	43.984	333	49.58	63.14	60	31.69
Mean Place	58.355		79.27	26.825		64.93	39.568		20.31	58.181		21.43
Sec δ , Tan δ	1.327		+0.873	5.173		-5.075	1.000		-0.004	2.176		-1.933
$D\phi\alpha$, $D\omega\alpha$	+0.06		+0.06	+0.07		-0.34	+0.06		0.00	+0.06		-0.13
$D\phi\delta$, $D\omega\delta$	-0.4		-0.1	-0.4		-0.1	-0.4		-0.1	-0.4		-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	20 Comae. Mag. 5.7		δ Corvi. Mag. 3.1		γ Cracis. Mag. 1.6		8 Canum Venat. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 25	° ' " +21 20	h m 12 25	° ' " -16 3	h m 12 26	° ' " -56 38	h m 12 29	° ' " +41 47
Jan. 0.7	34.365	64.53	35.120	15.13	33.971	44.91	49.531	68.22
10.7	34.711	62.71	35.461	17.37	34.490	46.90	49.933	66.83
20.7	35.043	61.26	35.786	19.65	34.979	49.34	50.321	65.96
30.7	35.349	60.19	36.063	21.92	35.426	52.12	50.680	65.62
Feb. 9.6	35.622	59.53	36.347	24.11	35.821	55.19	51.002	65.82
19.6	35.856	59.28	36.574	26.15	36.158	58.45	51.278	66.53
Mar. 1.6	36.046	59.41	36.760	28.03	36.431	61.81	51.502	67.70
11.6	36.192	59.89	36.905	29.69	36.642	65.21	51.671	69.26
21.5	36.294	60.69	37.009	31.14	36.790	68.56	51.784	71.12
31.5	36.354	61.72	37.076	32.35	36.875	71.81	51.844	73.21
Apr. 10.5	36.377	62.94	37.110	33.34	36.904	74.86	51.854	75.41
20.4	36.366	64.26	37.114	34.10	36.878	77.70	51.819	77.64
30.4	36.328	65.62	37.092	34.65	36.805	80.26	51.745	79.79
May 10.4	36.265	66.97	37.049	34.99	36.689	82.49	51.639	81.81
20.4	36.185	68.25	36.987	35.13	36.534	84.37	51.508	83.61
30.3	36.090	69.40	36.910	35.08	36.348	85.84	51.356	85.12
June 9.3	35.984	70.41	36.821	34.85	36.132	86.88	51.189	86.32
19.3	35.871	71.24	36.724	34.47	35.895	87.47	51.014	87.17
29.3	35.754	71.85	36.621	33.93	35.643	87.60	50.835	87.64
July 9.2	35.639	72.25	36.514	33.25	35.382	87.27	50.657	87.72
19.2	35.525	72.40	36.408	32.47	35.125	86.49	50.484	87.41
29.2	35.417	72.31	36.306	31.59	34.875	85.28	50.323	86.70
Aug. 8.1	35.320	71.97	36.213	30.65	34.644	83.69	50.175	85.62
18.1	35.237	71.37	36.133	29.69	34.444	81.76	50.048	84.18
28.1	35.175	70.52	36.073	28.74	34.288	79.55	49.944	82.39
Sept. 7.1	35.135	69.41	36.038	27.85	34.172	77.15	49.871	80.28
17.0	35.126	68.05	36.032	27.09	34.120	74.64	49.835	77.89
27.0	35.151	66.43	36.062	26.49	34.136	72.11	49.840	75.25
Oct. 7.0	35.214	64.59	36.133	26.10	34.226	69.68	49.891	72.40
17.0	35.319	62.52	36.248	25.99	34.393	67.47	49.992	69.37
26.9	35.409	60.27	36.407	26.18	34.639	65.55	50.145	66.26
Nov. 5.9	35.603	57.87	36.612	26.69	34.958	64.02	50.351	63.12
15.9	35.899	55.38	36.859	27.55	35.345	62.95	50.609	60.01
25.8	36.174	52.84	37.143	28.74	35.789	62.42	50.914	57.03
Dec. 5.8	36.482	50.33	37.457	30.23	36.279	62.45	51.258	54.25
15.8	36.813	47.92	37.791	32.01	36.797	63.04	51.638	51.76
25.8	37.158	45.69	38.136	34.00	37.328	64.19	52.029	49.65
35.7	37.506	43.72	38.481	36.18	37.856	65.87	52.430	47.97
Mean Place	33.217	80.18	34.065	12.48	33.028	54.24	48.338	89.82
Sec δ , Tan δ	1.074	+0.391	1.041	-0.288	1.819	-1.520	1.341	+0.894
$D\phi a$, $D_m a$	+0.06	+0.03	+0.06	-0.02	+0.07	-0.10	+0.06	+0.06
$D\phi \delta$, $D_m \delta$	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1

APPARENT PLACES OF STARS, 1917.

417

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Draconis. Mag. 3.9		β Corvi. Mag. 2.8		ϵ Comae seq. Mag. 5.2		α Muscae. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 29	° ' " +70 13	h m 12 30	° ' " -22 56	h m 12 30	° ' " +18 49	h m 12 32	° ' " -68 40
Jan. 0.7	58.43	77.66	2.421	16.71	59.134	46.63	13.88	30.62
10.7	59.18	76.97	2.774	18.93	59.477	44.74	14.61	32.33
20.7	59.91	76.94	3.111	21.28	59.807	43.20	15.31	34.56
30.7	60.59	77.55	3.420	23.68	60.112	42.02	15.95	37.23
Feb. 9.6	61.20	78.77	3.696	26.07	60.385	41.22	16.51	40.27
19.6	61.72	80.54	3.933	28.38	60.621	40.83	17.00	43.59
Mar. 1.6	62.14	82.78	4.129	30.57	60.814	40.81	17.39	47.11
11.6	62.43	85.38	4.282	32.58	60.964	41.15	17.69	50.73
21.5	62.61	88.23	4.395	34.42	61.071	41.80	17.90	54.37
31.5	62.67	91.21	4.469	36.08	61.137	42.69	18.02	57.97
Apr. 10.5	62.60	94.20	4.510	37.42	61.167	43.77	18.06	61.44
20.4	62.42	97.08	4.518	38.57	61.164	44.99	18.00	64.72
30.4	62.16	99.74	4.499	39.50	61.132	46.26	17.87	67.74
May 10.4	61.81	102.10	4.457	40.18	61.078	47.54	17.67	70.44
20.4	61.39	104.07	4.395	40.63	61.004	48.77	17.41	72.78
30.3	60.92	106.59	4.316	40.84	60.915	49.89	17.09	74.70
June 9.3	60.41	106.62	4.224	40.83	60.815	50.90	16.72	76.16
19.3	59.89	107.13	4.121	40.59	60.707	51.75	16.32	77.13
29.3	59.36	107.10	4.010	40.15	60.595	52.40	15.89	77.58
July 9.2	58.83	106.55	3.896	39.50	60.481	52.86	15.44	77.52
19.2	58.33	106.48	3.781	38.68	60.369	53.09	15.00	76.95
29.2	57.85	103.92	3.669	37.71	60.262	53.11	14.57	75.88
Aug. 8.1	57.42	101.89	3.565	36.61	60.164	52.88	14.17	74.34
18.1	57.05	99.44	3.476	35.41	60.078	52.42	13.81	72.38
28.1	56.74	96.62	3.407	34.19	60.013	51.70	13.52	70.07
Sept. 7.1	56.50	93.47	3.363	32.99	59.970	50.74	13.30	67.48
17.0	56.35	90.05	3.351	31.86	59.956	49.53	13.18	64.72
27.0	56.29	86.45	3.377	30.87	59.976	48.07	13.17	61.87
Oct. 7.0	56.32	82.72	3.446	30.08	60.034	46.37	13.26	59.06
17.0	56.45	78.94	3.560	29.54	60.133	44.45	13.47	56.40
26.9	56.69	75.19	3.722	29.31	60.276	42.31	13.80	53.99
Nov. 5.9	57.04	71.56	3.931	29.43	60.463	40.01	14.23	51.96
15.9	57.48	68.16	4.184	29.91	60.694	37.60	14.77	50.38
25.8	58.02	65.06	4.477	30.77	60.964	35.13	15.39	49.33
Dec. 5.8	58.64	62.35	4.801	32.00	61.266	32.65	16.08	48.88
15.8	59.32	60.12	5.147	33.57	61.592	30.25	16.81	49.02
25.8	60.04	58.44	5.504	35.43	61.932	27.99	17.56	49.77
35.7	60.79	57.38	5.860	37.53	62.277	25.97	18.30	51.13
Mean Place	56.924	104.25	1.405	16.40	58.031	61.51	13.073	42.18
Sec δ , Tan δ	2.958	+2.784	1.086	-0.423	1.057	+0.341	2.751	-2.562
$D_{\alpha} \alpha$, $D_{\alpha} \alpha$	+0.05	+0.18	+0.06	-0.03	+0.06	+0.02	+0.07	-0.17
$D_{\delta} \delta$, $D_{\delta} \delta$	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1	-0.4	-0.1

39398°—1917—27

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Virginis. Mag. 4.8		γ Centauri. Mag. 2.4		γ Virginis (mean). Mag. 2.9		ρ Virginis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 34	° ' " — 7 32	h m 12 36	° ' " —48 30	h m 12 37	° ' " — 0 59	h m 12 37	° ' " +10 41
Jan. 0.7	58.654	26.06	58.856	7.72	28.306	47.69	42.066	21.69
10.7	58.990 ³³⁶	28.22 ²¹⁶	57.308 ⁴⁵²	9.70 ¹⁹⁸	28.639 ³³³	49.81 ²¹²	42.424 ³³⁸	19.68 ²⁰¹
20.7	59.312 ³²²	30.35 ²¹³	57.740 ⁴³²	12.05 ²³⁵	28.959 ³²⁰	51.82 ²⁰¹	42.748 ³²⁴	17.90 ¹⁷⁸
30.7	59.609 ²⁹⁷	32.38 ²⁰³	58.137 ³⁹⁷	14.72 ²⁶⁷	29.255 ²⁹⁸	53.67 ¹⁸⁸	43.048 ³⁰⁰	16.42 ¹⁴⁸
Feb. 9.6	59.875 ²⁶⁸	34.24 ¹⁸⁶	58.492 ³⁵⁵	17.60 ²⁸⁸	29.520 ²⁶⁵	55.28 ¹⁶¹	43.318 ²⁷⁰	15.26 ¹¹⁶
19.6	60.106 ²³¹	35.89 ¹⁶⁵	58.799 ³⁰⁷	20.64 ³⁰⁴	29.751 ²³¹	56.85 ¹³⁷	43.554 ²³⁶	14.45 ⁸¹
Mar. 1.6	60.297 ¹⁹¹	37.32 ¹⁴³	59.053 ²⁵⁴	23.73 ³⁰⁹	29.942 ¹⁹¹	57.73 ¹⁰⁸	43.749 ¹⁹⁶	13.97 ⁴⁸
11.6	60.448 ¹⁵¹	38.50 ¹¹⁸	59.254 ²⁰¹	26.83 ³¹⁰	30.094 ¹⁸²	58.53 ⁸⁰	43.903 ¹⁵⁴	13.83 ¹⁴
21.5	60.560 ¹¹²	39.44 ⁹⁴	59.402 ¹⁴⁸	29.85 ³⁰²	30.206 ¹¹²	59.07 ⁵⁴	44.016 ¹¹³	14.00 ¹⁷
31.5	60.636 ⁷⁶	40.12 ⁶⁸	59.499 ⁹⁷	32.76 ²⁹¹	30.282 ⁷⁶	59.35 ²⁸	44.091 ⁷⁵	14.41 ⁴¹
Apr. 10.5	60.680 ⁴⁴	40.59 ⁴⁷	59.548 ⁴⁹	35.49 ²⁷⁸	30.326 ⁴⁴	59.42 ⁷	44.131 ⁴⁰	15.06 ⁶⁴
20.4	60.693 ¹³	40.85 ²⁶	59.554 ⁶	37.99 ²⁵⁰	30.338 ¹²	59.30 ¹²	44.140 ⁹	15.83 ⁷⁸
30.4	60.678 ¹⁵	40.93 ⁸	59.519 ³⁵	40.23 ²²⁴	30.324 ¹⁴	59.01 ²⁹	44.121 ¹⁹	16.73 ⁹⁰
May 10.4	60.643 ³⁵	40.84 ⁹	59.448 ⁷¹	42.17 ¹⁹⁴	30.289 ³⁵	58.60 ⁴¹	44.080 ⁴¹	17.68 ⁹⁵
20.4	60.590 ⁵³	40.61 ²³	59.344 ¹⁰⁴	43.77 ¹⁶⁰	30.234 ⁵⁵	58.09 ⁵¹	44.020 ⁶⁰	18.65 ⁹⁷
30.3	60.520 ⁷⁰	40.26 ³⁵	59.213 ¹³¹	45.01 ¹²⁴	30.164 ⁷⁰	57.51 ⁵⁸	43.944 ⁷⁶	19.60 ⁹⁵
June 9.3	60.439 ⁸¹	39.81 ⁴⁵	59.068 ¹⁵⁵	45.87 ⁸⁶	30.083 ⁸¹	56.89 ⁶²	43.856 ⁸⁸	20.49 ⁸⁹
19.3	60.349 ⁹⁰	39.28 ⁵³	58.884 ¹⁷⁴	46.34 ⁴⁷	29.993 ⁹⁰	56.25 ⁶⁴	43.760 ⁹⁶	21.30 ⁸¹
29.3	60.252 ⁹⁷	38.68 ⁶⁰	58.695 ¹⁸⁹	46.39 ⁵	29.896 ⁹⁷	55.60 ⁶⁵	43.658 ¹⁰²	21.98 ⁶⁸
July 9.2	60.150 ¹⁰²	38.03 ⁶⁵	58.497 ¹⁹⁸	46.08 ³⁶	29.795 ¹⁰¹	54.97 ⁶⁸	43.552 ¹⁰⁶	22.55 ⁵⁷
19.2	60.048 ¹⁰²	37.36 ⁶⁷	58.297 ²⁰⁰	45.28 ⁷⁵	29.693 ¹⁰²	54.37 ⁶⁰	43.447 ¹⁰⁵	22.97 ⁴²
29.2	59.949 ⁹⁹	36.67 ⁶⁹	58.102 ¹⁹⁵	44.16 ¹¹²	29.594 ⁹⁹	53.82 ⁵⁵	43.345 ¹⁰²	23.22 ²⁵
Aug. 8.1	59.857 ⁹²	35.99 ⁶⁸	57.919 ¹⁸³	42.70 ¹⁴⁶	29.502 ⁹²	53.35 ⁴⁷	43.251 ⁹⁴	23.31 ⁹
18.1	59.777 ⁸⁰	35.36 ⁶³	57.757 ¹⁶²	40.94 ¹⁷⁶	29.420 ⁸²	52.98 ³⁷	43.168 ⁸³	23.21 ¹⁰
28.1	59.715 ⁶²	34.81 ⁵⁵	57.625 ¹³²	38.96 ¹⁹⁸	29.356 ⁶⁴	52.73 ²⁶	43.102 ⁶⁶	22.90 ³¹
Sept. 7.1	59.674 ⁴¹	34.36 ⁴⁵	57.530 ⁹⁵	36.81 ²¹⁵	29.313 ⁴³	52.62 ¹¹	43.058 ⁴⁴	22.38 ⁵²
17.0	59.662 ¹²	34.08 ²⁸	57.484 ⁴⁶	34.58 ²²³	29.297 ¹⁶	52.69 ⁷	43.041 ¹⁷	21.63 ⁷⁵
27.0	59.683 ²¹	33.97 ¹¹	57.491 ⁷	32.36 ²²³	29.314 ¹⁷	52.98 ²⁹	43.056 ¹⁵	20.65 ⁹⁸
Oct. 7.0	59.743 ⁶⁰	34.09 ¹²	57.559 ⁶⁸	30.25 ²¹¹	30.274 ⁵⁶	52.98 ⁵²	43.056 ⁵³	20.65 ¹²³
17.0	59.844 ¹⁰¹	34.47 ³⁸	57.692 ¹³³	28.34 ¹⁹¹	29.370 ⁹⁵	53.50 ⁷⁸	43.109 ⁹²	19.42 ¹⁴⁷
26.9	59.989 ¹⁴⁵	35.13 ⁶⁶	57.891 ¹⁹⁹	26.72 ¹⁶²	29.465 ¹³⁸	54.28 ¹⁰²	43.201 ¹³⁷	17.95 ¹⁷⁰
Nov. 5.9	59.989 ¹⁸⁸	35.13 ⁹⁴	57.891 ²⁶³	26.72 ¹²⁶	29.603 ¹⁸³	55.30 ¹³⁰	43.338 ¹⁸¹	16.25 ¹⁹¹
15.9	60.177 ²³²	36.07 ¹²³	58.154 ³²³	25.47 ⁸⁰	29.786 ²²⁶	56.60 ¹⁶⁵	43.519 ²²⁸	14.34 ²¹⁰
25.8	60.409 ²⁷⁰	37.30 ¹⁵¹	58.477 ³⁷⁴	24.67 ³²	30.011 ²⁶³	58.15 ¹⁷⁷	43.742 ²⁶²	12.24 ²²²
Dec. 5.8	60.679 ³⁰¹	38.81 ¹⁷⁵	58.851 ⁴¹⁵	24.35 ²⁰	30.274 ²⁶⁵	59.92 ¹⁸⁵	44.004 ²⁶⁴	10.02 ²²⁹
15.8	60.980 ³²²	40.56 ¹⁹⁴	59.266 ⁴⁴⁴	24.55 ⁷²	30.569 ³¹⁷	61.87 ²¹⁰	44.298 ³¹⁸	7.73 ²³¹
25.8	61.302 ³³⁵	42.50 ²⁰⁸	59.710 ⁴⁵⁸	25.27 ¹²³	30.886 ³³⁰	63.97 ²¹⁴	44.616 ³³³	5.42 ²²⁵
35.7	61.637 ³³⁸	44.58 ²¹⁴	60.168 ⁴⁵⁸	26.50 ¹⁷⁰	31.216 ³³⁴	66.11 ²¹⁴	44.949 ³³⁶	3.17 ²¹¹
35.7	61.975	46.72	60.626	28.20	31.550	68.25	45.285	1.06
Mean Place	57.636	20.34	55.952	15.08	27.290	39.62	41.049	33.89
Sec δ , Tan δ	1.009	-0.132	1.509	-1.131	1.000	-0.017	1.018	+0.189
$D\phi a$, $D_{\infty} a$	+0.06	-0.01	+0.07	-0.07	+0.06	0.00	+0.07	+0.01
$D\phi \delta$, $D_{\infty} \delta$	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	76 Ursa Majoris. Mag. 5.9		β Crucis. Mag. 1.5		31 Comae. Mag. 5.1		7 Centauri. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 37	° ' " +63 9	h m 12 42	° ' " -59 13	h m 12 47	° ' " +27 58	h m 12 48	° ' " -39 43
Jan. 0.8	57.89	41.04	52.445	57.35	40.405	73.63	50.925	34.90
10.7	58.48	40.07	53.004	59.09	40.765	71.82	51.335	36.87
20.7	59.06	39.73	53.537	61.30	41.113	70.40	51.727	39.13
30.7	59.60	40.08	54.081	63.91	41.442	69.44	52.092	41.64
Feb. 9.6	60.08	40.95	54.475	66.82	41.740	68.94	52.423	44.80
19.6	60.50	42.42	54.860	69.97	42.000	68.91	52.712	47.04
Mar. 1.6	60.84	44.39	55.180	73.27	42.217	69.32	52.956	49.81
11.6	61.09	46.75	55.436	76.65	42.390	70.12	53.153	52.53
21.5	61.26	49.41	55.624	80.02	42.517	71.26	53.305	55.15
31.5	61.34	52.23	55.748	83.33	42.600	72.66	53.412	57.64
Apr. 10.5	61.31	55.11	55.810	86.50	42.644	74.26	53.478	59.94
20.5	61.22	57.93	55.814	89.46	42.649	75.96	53.507	62.02
30.4	61.06	60.50	55.762	92.19	42.622	77.70	53.501	63.87
May 10.4	60.83	63.00	55.661	94.60	42.568	79.40	53.463	65.43
20.4	60.55	65.06	55.515	96.67	42.489	80.99	53.397	66.71
30.3	60.24	66.72	55.330	98.36	42.392	82.43	53.307	67.68
June 9.3	59.89	67.92	55.109	99.62	42.279	83.67	53.194	68.32
19.3	59.53	68.65	54.859	100.44	42.157	84.67	53.064	68.62
29.3	59.16	68.88	54.588	100.80	42.027	85.39	52.919	68.59
July 9.2	58.79	68.59	54.304	100.69	41.892	85.84	52.764	68.21
19.2	58.43	67.80	54.016	100.11	41.758	85.98	52.605	67.51
29.2	58.09	66.52	53.732	99.08	41.628	85.81	52.446	66.51
Aug. 8.2	57.78	64.79	53.466	97.64	41.506	85.34	52.295	65.23
18.1	57.50	62.62	53.226	95.82	41.397	84.55	52.158	63.72
28.1	57.27	60.06	53.026	93.68	41.306	83.46	52.044	62.02
Sept. 7.1	57.09	57.18	52.877	91.31	41.239	82.08	51.960	60.21
17.0	56.97	53.99	52.790	88.78	41.200	80.40	51.914	58.35
27.0	56.92	50.58	52.774	86.20	41.195	78.47	51.914	56.52
Oct. 7.0	56.94	46.99	52.838	83.66	41.230	76.28	51.965	54.82
17.0	57.04	43.31	52.985	81.28	41.309	73.89	52.072	53.30
26.9	57.22	39.63	53.217	79.17	41.434	71.31	52.237	52.08
Nov. 5.9	57.48	36.01	53.532	77.42	41.607	68.60	52.459	51.19
15.9	57.82	32.56	53.921	76.09	41.827	65.82	52.735	50.70
25.9	58.24	29.36	54.376	75.27	42.091	63.04	53.060	50.67
Dec. 5.8	58.72	26.50	54.884	75.00	42.392	60.32	53.424	51.10
15.8	59.25	24.08	55.429	75.30	42.722	57.77	53.816	51.99
25.8	59.82	22.18	55.992	76.17	43.072	55.44	54.224	53.32
35.7	60.41	20.85	56.556	77.59	43.429	53.42	54.635	55.05
Mean Place	56.652	66.88	51.646	67.14	39.407	91.52	50.062	39.77
Sec δ , Tan δ	2.215	+1.976	1.955	-1.680	1.132	+0.531	1.300	-0.831
$D\psi a$, $D\omega a$	+0.05	+0.13	+0.07	-0.11	+0.06	+0.03	+0.07	-0.05
$D\psi \delta$, $D\omega \delta$	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Ursa Majoris. (Alloth.) Mag. 1.7		δ Virginis. Mag. 3.7		α Can. Ven. seq. Mag. 2.9		δ Muscae. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 50	° ' " +56 23	h m 12 51	° ' " + 3 50	h m 12 52	° ' " +38 45	h m 12 56	° ' " -71 5
Jan. 0.8	23.948 ⁵⁰¹	71.62 ¹²⁸	26.250 ³³⁴	43.90 ²⁰⁹	9.829 ³⁸⁰	38.03 ¹⁰⁶	32.73 ⁸⁴	53.47 ¹⁸¹
10.7	24.449 ⁴⁹²	70.34 ⁶⁸	26.584 ³²⁴	41.81 ¹⁹³	10.219 ³⁸¹	36.37 ¹¹⁶	33.57 ⁸⁰	54.78 ¹⁸⁶
20.7	24.941 ⁴⁶⁷	69.66 ⁴	26.908 ³⁰²	39.88 ¹⁷⁰	10.600 ³⁵⁹	35.21 ⁶⁴	34.37 ⁷⁵	56.64 ²³⁴
30.7	25.408 ⁴²⁵	69.62 ⁵⁵	27.210 ²⁷⁵	38.18 ¹⁴⁵	10.959 ³²⁸	34.57 ¹⁰	35.12 ⁶⁹	58.98 ²⁷⁶
Feb. 9.6	25.833 ³⁷⁰	70.17 ¹¹³	27.485 ²⁴¹	36.73 ¹¹⁴	11.287 ²⁸⁷	34.47 ⁴²	35.81 ⁶¹	61.74 ³⁰⁹
19.6	26.203 ³⁰⁹	71.30 ¹⁶⁵	27.726 ²⁰⁸	35.59 ⁸⁴	11.574 ²⁴¹	34.89 ⁹¹	36.42 ⁵⁰	64.83 ³³²
Mar. 1.6	26.512 ²³⁸	72.95 ²⁰⁸	27.929 ¹⁶⁵	34.75 ⁵⁴	11.815 ¹⁹⁰	35.80 ¹³⁸	36.92 ⁴¹	68.15 ³⁵⁰
11.6	26.750 ¹⁶⁶	75.03 ²³⁹	28.094 ¹²⁶	34.21 ²⁴	12.005 ¹⁸⁸	37.13 ¹⁶⁸	37.33 ³¹	71.65 ³⁶¹
21.5	26.916 ⁹³	77.42 ²⁶³	28.220 ⁸⁹	33.97 ²	12.143 ⁸⁹	38.81 ¹⁹³	37.64 ²²	75.26 ³⁵⁹
31.5	27.009 ²⁴	80.05 ²⁷⁴	28.309 ⁵⁵	33.99 ²⁵	12.232 ⁴¹	40.74 ²¹²	37.86 ¹⁰	78.85 ³⁵³
Apr. 10.5	27.033 ⁴²	82.79 ²⁷⁴	28.364 ²⁴	34.24 ⁴²	12.273 ²	42.86 ²¹⁸	37.96 ²	82.38 ³³⁹
20.5	26.991 ¹⁰¹	85.53 ²⁶³	28.388 ²	34.66 ⁵⁷	12.271 ⁴¹	45.04 ²¹⁷	37.98 ⁷	85.77 ³¹⁹
30.4	26.890 ¹⁵¹	88.16 ²⁴⁴	28.386 ²⁷	35.23 ⁶⁸	12.230 ⁷⁵	47.21 ²⁰⁷	37.91 ¹⁶	88.96 ²⁹¹
May 10.4	26.739 ¹⁹²	90.60 ²¹⁵	28.359 ⁴⁶	35.91 ⁷⁴	12.155 ¹⁰²	49.28 ¹⁹¹	37.75 ²⁴	91.87 ²⁵⁸
20.4	26.547 ²²⁸	92.75 ¹⁸⁰	28.313 ⁶²	36.65 ⁷⁶	12.063 ¹³⁶	51.19 ¹⁶⁶	37.51 ³¹	94.45 ²²⁰
30.3	26.319 ²⁵⁵	94.55 ¹⁴¹	28.251 ⁷⁸	37.41 ⁷⁷	11.927 ¹⁴¹	52.85 ¹³⁹	37.20 ³⁸	96.65 ¹⁷⁷
June 9.3	26.064 ²⁷¹	95.96 ⁹⁵	28.173 ⁸⁹	38.18 ⁷⁴	11.786 ¹⁵⁹	54.24 ¹⁰⁶	36.82 ⁴³	98.42 ¹³¹
19.3	25.793 ²⁸²	96.91 ⁴⁹	28.084 ⁹⁷	38.92 ⁶⁹	11.627 ¹⁶⁶	55.30 ⁷¹	36.39 ⁴⁷	99.73 ⁸¹
29.3	25.511 ²⁸⁵	97.40 ¹	27.987 ¹⁰³	39.61 ⁶³	11.461 ¹⁶⁹	56.01 ³³	36.92 ⁵⁰	100.54 ²⁷
July 9.2	25.226 ²⁸¹	97.41 ⁴⁷	27.884 ¹⁰⁵	40.24 ⁵⁵	11.292 ¹⁶⁹	56.34 ⁵	35.42 ⁵¹	100.81 ²³
19.2	24.945 ²⁷⁰	96.94 ⁹⁵	27.779 ¹⁰⁵	40.79 ⁴⁵	11.123 ¹⁶³	56.29 ⁴²	34.91 ⁵¹	100.58 ⁷⁵
29.2	24.675 ²⁵¹	95.99 ¹⁴⁰	27.674 ¹⁰⁰	41.24 ³³	10.960 ¹⁵⁴	55.87 ⁸¹	34.40 ⁴⁹	99.83 ¹²⁵
Aug. 8.2	24.424 ²²⁶	94.59 ¹⁸³	27.574 ⁹¹	41.57 ¹⁸	10.806 ¹⁴⁰	55.06 ¹¹⁹	33.91 ⁴⁴	98.58 ¹⁷¹
18.1	24.198 ¹⁹⁴	92.76 ²²³	27.483 ⁷⁵	41.75 ⁴	10.666 ¹¹⁸	53.87 ¹⁵³	33.47 ³⁷	96.87 ²¹²
28.1	24.004 ¹⁵⁴	90.53 ²⁶⁰	27.408 ⁵⁶	41.79 ¹⁵	10.548 ⁹³	52.34 ¹⁸⁶	33.10 ³⁰	94.75 ²⁴³
Sept. 7.1	23.850 ¹⁰⁷	87.93 ²⁹⁰	27.352 ²⁹	41.64 ⁸⁴	10.455 ⁶⁰	50.48 ²¹⁸	32.80 ²¹	92.32 ²⁶⁹
17.0	23.743 ⁵⁴	85.03 ³¹⁷	27.323 ¹	41.30 ⁵⁶	10.395 ²²	48.30 ²⁴⁶	32.59 ⁹	89.63 ²⁸³
27.0	23.689 ⁶	81.86 ³³⁷	27.324 ³⁹	40.74 ⁸¹	10.373 ²³	45.84 ²⁷⁰	32.50 ³	86.80 ²⁸⁸
Oct. 7.0	23.695 ⁷⁰	78.49 ³⁵²	27.363 ⁸¹	39.93 ¹⁰⁴	10.396 ⁷⁰	43.14 ²⁸⁹	32.53 ¹⁷	83.92 ²⁹⁰
17.0	23.765 ¹³⁹	74.97 ³⁵⁸	27.444 ¹²⁴	38.89 ¹³⁰	10.466 ¹²¹	40.25 ³⁰⁴	32.70 ²⁹	81.12 ²⁶⁰
26.9	23.904 ²⁰⁸	71.39 ³⁵⁸	27.568 ¹⁶⁸	37.59 ¹⁵⁵	10.587 ¹⁷⁵	37.21 ³¹²	32.99 ⁴²	78.52 ²³²
Nov. 5.9	24.112 ²⁷⁸	67.81 ³⁴⁵	27.736 ²¹²	36.04 ¹⁷⁶	10.762 ²²⁷	34.09 ³¹³	33.41 ⁵⁴	76.20 ¹⁹⁰
15.9	24.390 ³⁴²	64.35 ³²⁸	27.948 ²⁵²	34.28 ¹⁹⁵	10.989 ²⁷⁵	30.96 ³⁰⁵	33.95 ⁶⁶	74.30 ¹³⁹
25.9	24.732 ³⁹⁹	61.07 ²⁹⁹	28.200 ²⁸⁵	32.33 ²¹⁰	11.264 ³¹⁸	27.91 ²⁸⁰	34.61 ⁷³	72.91 ⁸⁷
Dec. 5.8	25.131 ⁴⁴⁵	58.08 ²⁶¹	28.485 ³¹¹	30.23 ²¹⁸	11.582 ³⁵³	25.01 ²⁶⁵	35.34 ⁷⁹	72.04 ²⁶
15.8	25.576 ⁴⁷⁷	55.47 ²¹⁵	28.796 ³²⁷	28.05 ²²⁰	11.935 ³⁷⁵	22.36 ²³⁴	36.13 ⁸³	71.78 ³⁴
25.8	26.053 ⁴⁹⁷	53.32 ¹⁶²	29.123 ³³³	25.85 ²¹⁴	12.310 ³⁸⁵	20.02 ¹⁹²	36.96 ⁸³	72.12 ²⁴
35.7	26.550	51.70	29.456	23.71	12.695	18.10	37.79	73.07 ⁹⁵
Mean Place	22.936	96.46	25.308	53.79	8.856	58.99	32.256	65.16
Sec δ , Tan δ	1.807	+1.505	1.002	+0.067	1.282	+0.803	3.088	-2.922
$D\psi\alpha$, $D\omega\alpha$	+0.05	+0.10	+0.06	0.00	+0.06	+0.05	+0.08	-0.19
$D\psi\delta$, $D\omega\delta$	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2	-0.4	-0.2

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Virginis. Mag. 3.0		θ Virginis. Mag. 4.4		43 Comae. Mag. 4.3		90 Canum Venat. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 58	° ' " +11 23	h m 13 5	° ' " - 5 5	h m 13 8	° ' " +28 17	h m 13 13	° ' " +40 59
Jan. 0.8	3.623	65.41	39.882	53.04	0.960	37.03	50.216	72.15
10.7	3.961 ³³⁸	63.36 ²⁰⁵	40.220 ³³⁸	55.13 ²⁰⁹	1.318 ³⁵⁸	35.12 ¹⁹¹	50.611 ³⁹⁵	70.33 ¹⁸²
20.7	4.289 ³²⁸	61.55 ¹⁸¹	40.549 ³²⁹	57.17 ²⁰⁴	1.668 ³⁵⁰	33.62 ¹⁵⁰	51.002 ³⁹¹	69.03 ¹³⁰
30.7	4.597 ³⁰⁸	60.04 ¹⁵¹	40.858 ³⁰⁹	59.09 ¹⁹²	2.003 ³³⁵	32.57 ¹⁰⁵	51.378 ³⁷⁶	68.28 ⁷⁵
Feb. 9.7	4.880 ²⁸³	58.87 ¹¹⁷	41.143 ²⁸⁵	60.82 ¹⁷³	2.310 ³⁰⁷	31.99 ⁵⁸	51.726 ³⁴⁸	68.09 ¹⁹
	249	82	262	152	273	9	310	35
19.6	5.129	58.05	41.395	62.34	2.583	31.90	52.036	68.44
Mar. 1.6	5.340 ²¹¹	57.59 ⁴⁶	41.612 ²¹⁷	63.61 ¹²⁷	2.818 ²³⁵	32.27 ³⁷	52.304 ²⁶⁸	69.31 ⁸⁷
11.6	5.512 ¹⁷²	57.48 ¹¹	41.791 ¹⁷⁹	64.63 ¹⁰²	3.009 ¹⁹¹	33.05 ⁷⁸	52.522 ²¹⁸	70.65 ¹³⁴
21.6	5.644 ¹³²	57.68 ²⁰	41.934 ¹⁴³	65.38 ⁷⁵	3.158 ¹⁴⁷	34.20 ¹¹⁵	52.690 ¹⁶⁸	72.37 ¹⁷²
31.5	5.740 ⁹⁶	58.15 ⁴⁷	42.041 ¹⁰⁷	65.89 ⁵¹	3.259 ¹⁰³	35.64 ¹⁴⁴	52.807 ¹¹⁷	74.39 ²⁰²
	59	72	73	28	63	167	66	222
Apr. 10.5	5.799	58.87	42.114	66.17	3.322	37.31	52.873	76.61
20.5	5.826 ²⁷	59.74 ⁸⁷	42.157 ⁴³	66.25 ⁸	3.347 ²⁵	39.11 ¹⁸⁰	52.894 ²¹	78.94 ²³³
30.4	5.826 ⁰	60.72 ⁹⁶	42.172 ¹⁵	66.16 ⁹	3.339 ⁸	40.96 ¹⁸⁵	52.873 ²¹	81.28 ²³⁴
May 10.4	5.800 ²⁶	61.77 ¹⁰⁵	42.163 ⁹	65.91 ²⁵	3.300 ³⁹	42.79 ¹⁸³	52.814 ⁵⁹	83.55 ²²⁷
20.4	5.753 ⁴⁷	62.84 ¹⁰⁷	42.131 ³²	65.58 ³⁵	3.235 ⁶⁵	44.54 ¹⁷⁵	52.723 ⁹¹	85.65 ²¹⁰
	66	104	49	45	87	160	119	189
30.4	5.687	63.88	42.082	65.11	3.148	46.14	52.604	87.54
June 9.3	5.607 ⁸⁰	64.86 ⁹⁸	42.015 ⁶⁷	64.59 ⁵²	3.044 ¹⁰⁴	47.55 ¹⁴¹	52.463 ¹⁴¹	89.14 ¹⁶⁰
19.3	5.515 ⁹²	65.75 ⁸⁹	41.935 ⁸⁰	64.01 ⁵⁸	2.924 ¹²⁰	48.71 ¹¹⁶	52.303 ¹⁶⁰	90.40 ¹²⁶
29.3	5.414 ¹⁰¹	66.52 ⁷⁷	41.844 ⁹¹	63.40 ⁶¹	2.793 ¹³¹	49.61 ⁹⁰	52.131 ¹⁷²	91.30 ⁹⁰
July 9.3	5.306 ¹⁰⁸	67.15 ⁶³	41.744 ¹⁰⁰	62.77 ⁶³	2.655 ¹³⁸	50.22 ⁶¹	51.951 ¹⁸⁰	91.81 ⁵¹
	112	47	106	62	141	30	185	11
19.2	5.194	67.62	41.638	62.15	2.514	50.52	51.766	91.92
29.2	5.083 ¹¹¹	67.91 ²⁹	41.530 ¹⁰⁸	61.54 ⁶¹	2.372 ¹⁴²	50.51 ¹	51.581 ¹⁸⁵	91.63 ²⁹
Aug. 8.2	4.977 ¹⁰⁶	68.03 ¹²	41.425 ¹⁰⁵	60.96 ⁵⁸	2.235 ¹³⁷	50.17 ³⁴	51.404 ¹⁷⁷	90.92 ⁷¹
18.1	4.879 ⁹⁸	67.95 ⁸	41.327 ⁹⁸	60.45 ⁵¹	2.108 ¹²⁷	49.51 ⁶⁶	51.239 ¹⁶⁵	89.82 ¹¹⁰
28.1	4.795 ⁸⁴	67.65 ³⁰	41.241 ⁸⁶	60.03 ⁴²	1.997 ¹¹¹	48.54 ⁹⁷	51.091 ¹⁴⁸	88.34 ¹⁴⁸
	63	51	65	30	92	130	123	184
Sept. 7.1	4.732	67.14	41.176	59.73	1.905	47.24	50.968	86.50
17.1	4.694 ³⁸	66.38 ⁷⁶	41.135 ⁴¹	59.58 ¹⁵	1.842 ⁶³	45.65 ¹⁵⁹	50.876 ⁹²	84.32 ²¹⁸
27.0	4.687 ⁷	65.39 ⁹⁹	41.126 ⁹	59.60 ²	1.813 ²⁹	43.78 ¹⁸⁷	50.821 ⁵⁵	81.84 ²⁴⁸
Oct. 7.0	4.717 ³⁰	64.14 ¹²⁵	41.154 ²⁸	59.85 ²⁵	1.822 ⁹	41.64 ²¹⁴	50.811 ¹⁰	79.10 ²⁷⁴
17.0	4.788 ⁷¹	62.66 ¹⁴⁸	41.223 ⁶⁹	60.33 ⁴⁸	1.874 ⁵²	39.27 ²³⁷	50.850 ³⁹	76.13 ²⁹⁷
	116	172	115	75	100	257	94	313
26.9	4.904	60.94	41.338	61.08	1.974	36.70	50.944	73.00
Nov. 5.9	5.065 ¹⁶¹	59.01 ¹⁹⁸	41.499 ¹⁶¹	62.09 ¹⁰¹	2.124 ¹⁵⁰	33.99 ²⁷¹	51.091 ¹⁴⁷	69.77 ³²³
15.9	5.270 ²⁰⁵	56.88 ²¹³	41.704 ²⁰⁵	63.38 ¹²⁹	2.322 ¹⁹⁸	31.18 ²⁸¹	51.294 ²⁰³	66.61 ³²⁶
25.9	5.516 ²⁴⁶	54.63 ²²⁵	41.951 ²⁴⁷	64.92 ¹⁵⁴	2.566 ²⁴⁴	28.35 ²⁸³	51.550 ²⁵⁶	63.32 ³¹⁹
Dec. 5.8	5.797 ²⁸¹	52.30 ²³³	42.232 ²⁸¹	66.66 ¹⁷⁴	2.849 ²⁸³	25.58 ²⁷⁷	51.853 ³⁰³	60.28 ³⁰⁴
	310	234	310	192	318	263	343	282
15.8	6.107	49.96	42.542	68.58	3.167	22.95	52.196	57.46
25.8	6.433 ³²⁶	47.68 ²²⁸	42.869 ³²⁷	70.61 ²⁰³	3.507 ³⁴⁰	20.53 ²⁴²	52.566 ³⁷⁰	54.98 ²⁴⁸
35.8	6.768 ³³⁵	45.53 ²¹⁵	43.204 ³³⁵	72.70 ²⁰⁹	3.860 ³⁵³	18.42 ²¹¹	52.956 ³⁹⁰	52.90 ²⁰⁶
Mean Place	2.714	77.96	39.035	46.26	0.119	55.05	49.448	93.61
Sec δ, Tan δ	1.020	+0.202	1.004	-0.089	1.136	+0.538	1.325	+0.869
Dψ α, Dα α	+0.06	+0.01	+0.06	-0.01	+0.06	+0.03	+0.05	+0.06
Dψ δ, Dα δ	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3

APPARENT PLACES OF STARS, 1917.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydræ. Mag. 3.3		ϵ Centauri. Mag. 2.9		ζ^1 Ursæ Majoris. (Mizar.) Mag. 2.4		α Virginis. (Spica.) Mag. 1.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 14	° ' " -22 44	h m 13 15	° ' " -36 16	h m 13 20	° ' " +55 20	h m 13 20	° ' " -10 43
Jan. 0.8	25.109	2.90	56.183	25.81	35.856	66.18	49.845	47.05
10.7	25.469 360	4.84 194	56.581 398	27.56 175	36.339 483	64.54 164	50.188 343	49.07 203
20.7	25.820 351	6.93 209	56.971 390	29.60 204	36.823 484	63.49 106	50.524 336	51.11 204
30.7	26.154 334	9.09 216	57.340 369	31.84 224	37.291 468	63.07 42	50.843 319	53.09 198
Feb. 9.7	26.460 306	11.26 217	57.679 339	34.23 239	37.728 437	63.28 21	51.138 285	54.95 186
	275	210	304	247	393	82	266	160
19.6	26.735	13.36	57.983	36.70	38.121	64.10	51.404	56.64
Mar. 1.6	26.973 238	15.38 202	58.248 265	39.19 249	38.460 339	65.48 138	51.636 232	58.14 160
11.6	27.173 200	17.26 188	58.471 223	41.65 246	38.736 276	67.34 186	51.832 196	59.43 130
21.6	27.336 163	18.97 171	58.651 180	44.02 237	38.947 211	69.60 226	51.991 159	60.47 104
31.5	27.460 124	20.50 153	58.791 140	46.27 225	39.087 140	72.16 256	52.115 124	61.30 83
	91	134	100	208	74	273	92	80
Apr. 10.5	27.551	21.84	58.891	48.35	39.161	74.89	52.207	61.89
20.5	27.609 58	22.96 112	58.955 64	50.25 190	39.171 10	77.70 281	52.267 60	62.30 41
30.4	27.636 27	23.89 93	58.983 28	51.93 168	39.120 51	80.47 277	52.298 31	62.51 21
May 10.4	27.638	24.61 72	58.980 3	53.39 146	39.016 104	83.09 262	52.305 7	62.56 5
20.4	27.614 24	25.13 52	58.947 33	54.59 120	38.865 151	85.50 241	52.287 18	62.47 9
	46	31	60	95	191	210	38	23
30.4	27.568	25.44 12	58.887 84	55.54 65	38.674 225	87.60 173	52.249 57	62.24 33
June 9.3	27.501 67	25.56 7	58.803 105	56.19 87	38.449 251	89.33 131	52.192 75	61.91 42
19.3	27.418 83	25.49 27	58.698 125	56.56 8	38.198 268	90.64 87	52.117 88	61.49 50
29.3	27.319 99	25.22 44	58.573 139	56.64 22	37.930 279	91.51 39	52.029 100	60.99 57
July 9.3	27.208 111	24.78 61	58.434 149	56.42 51	37.651 285	91.90 9	51.929 109	60.42 62
19.2	27.088	24.17 77	58.285 154	55.91 79	37.366 283	91.81 57	51.820 113	59.80 66
29.2	26.965 123	23.40 89	58.131 153	55.12 104	37.083 272	91.24 105	51.707 118	59.14 67
Aug. 8.2	26.842 123	22.51 99	57.978 144	54.08 127	36.811 254	90.19 150	51.594 108	58.47 66
18.1	26.727 102	21.52 106	57.834 127	52.81 144	36.557 231	88.69 193	51.486 97	57.81 63
28.1	26.625 81	20.46 107	57.707 104	51.37 156	36.326 196	86.76 232	51.389 79	57.18 55
Sept. 7.1	26.544	19.39	57.603	49.81	36.130	84.44	51.310	56.63
17.1	26.490 54	18.35 104	57.533 70	48.18 163	35.975 155	81.74 270	51.255 55	56.19 44
27.0	26.471 19	17.40 95	57.503 30	46.56 162	35.868 107	78.74 300	51.232 23	55.90 29
Oct. 7.0	26.492 21	16.59 81	57.520 17	45.03 153	35.818 50	75.49 325	51.246 14	55.79 11
17.0	26.560 68	15.99 60	57.591 71	43.65 138	35.830 12	72.03 346	51.302 56	55.91 12
	117	34	128	113	80	358	103	37
27.0	26.677	15.65 5	57.719	42.52 83	35.910	68.45	51.405	56.28
Nov. 5.9	26.844 167	15.60 28	57.904 185	41.69 48	36.061 151	64.83 362	51.555 150	56.93 65
15.9	27.060 216	15.88 63	58.143 239	41.21 7	36.282 221	61.24 359	51.751 196	57.86 93
25.9	27.321 261	16.51 96	58.433 290	41.14 35	36.571 289	57.80 344	51.991 240	59.07 121
Dec. 5.8	27.621 300	17.47 129	58.765 368	41.49 76	36.922 351	54.58 322	52.268 308	60.53 146
	329	158	387	116	404	289	308	160
15.8	27.950	18.76	59.131	42.25	37.326	51.69	52.576	62.22
25.8	28.300 350	20.34 180	59.518 387	43.41 154	37.771 445	49.22 247	52.904 328	64.08 186
35.8	28.656 356	22.14	59.915 397	44.95	38.242 471	47.25 197	53.242 338	66.04 196
Mean Place	24.338	2.20	55.465	29.40	35.249	90.68	49.090	42.19
Sec δ , Tan δ	1.084	-0.419	1.240	-0.734	1.759	+1.447	1.018	-0.189
$D\psi a$, $D\omega a$	+0.06	-0.03	+0.07	-0.05	+0.05	+0.09	+0.06	-0.01
$D\psi \delta$, $D\omega \delta$	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3	-0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

		Groombridge 8001. Mag. 6.1		70 Virginis. Mag. 5.2		ζ Virginis. Mag. 3.4		17 H. Canum Venat. Mag. 5.0	
Washington Mean Time.		Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
		h m 13 23	° ' " s +72 48	h m 13 24	° ' " s +14 12	h m 13 30	° ' " s - 0 10	h m 13 31	° ' " s +37 35
		s	"	s	"	s	"	s	"
Jan.	0.8	61.06	53.20	22.964	64.74	28.443	27.34	6.195	66.10
	10.8	61.88 ⁸²	51.87 ¹³³	23.302 ³³⁸	62.63 ²¹¹	28.778 ³³⁵	29.41 ²⁰⁷	6.574 ³⁷⁹	64.10 ²⁰⁰
	20.7	62.70 ⁸²	51.19 ⁶⁸	23.636 ³³⁴	60.75 ¹⁸⁶	29.108 ³³⁰	31.38 ¹⁹⁷	6.954 ³⁸⁰	62.58 ¹⁵²
	30.7	63.51 ⁸¹	51.19 ⁰	23.956 ³²⁰	59.24 ¹⁵³	29.425 ³¹⁷	33.18 ¹⁸⁰	7.322 ³⁶⁸	61.59 ⁹⁹
Feb.	9.7	64.27 ⁷⁶	51.85 ⁶⁶	24.253 ²⁹⁷	58.08 ¹¹⁶	29.719 ²⁹⁴	34.74 ¹⁵⁶	7.666 ³⁴⁴	61.16 ⁴³
		69	128	267	77	267	132	312	10
	19.6	64.96	53.13	24.520	57.31	29.986	36.06	7.978	61.26
Mar.	1.6	65.56 ⁶⁰	54.98 ¹⁸⁵	24.754 ²³⁴	56.92 ³⁹	30.221 ²³⁵	37.08 ¹⁰²	8.251 ²⁷³	61.89 ⁶³
	11.6	66.03 ⁴⁷	57.31 ²³³	24.950 ¹⁹⁶	56.90 ²	30.420 ¹⁹⁹	37.81 ⁷⁸	8.480 ²²⁹	63.00 ¹¹¹
	21.6	66.38 ³⁵	60.01 ²⁷⁰	25.109 ¹⁵⁹	57.23 ⁶³	30.584 ¹⁶⁴	38.26 ⁴⁵	8.662 ¹⁸²	64.52 ¹⁵²
	31.5	66.60 ²²	62.95 ²⁰⁴	25.230 ¹²¹	57.86 ³³	30.713 ¹²⁹	38.44 ¹⁸	8.797 ¹³⁵	66.36 ¹⁸⁴
		8	310	85	88	96	5	89	209
Apr.	10.5	66.68	66.05	25.315	58.74	30.809	38.39	8.886	68.45
	20.5	66.63 ⁵	69.16 ³¹¹	25.367 ⁵²	59.80 ¹⁰⁶	30.874 ⁶⁵	38.13 ²⁶	8.932 ⁴⁶	70.68 ²²⁸
	30.5	66.46 ¹⁷	72.16 ³⁰⁰	25.388 ²¹	60.99 ¹¹⁹	30.911 ³⁷	37.71 ⁴²	8.937 ⁵	72.97 ²²⁹
May	10.4	66.18 ²⁸	74.96 ²⁸⁰	25.383 ⁵	62.24 ¹²⁵	30.921 ¹⁰	37.16 ⁵⁵	8.905 ³²	75.22 ²²⁵
	20.4	65.80 ³⁸	77.45 ²⁴⁹	25.353 ³⁰	63.51 ¹²⁷	30.907 ¹⁴	36.53 ⁶³	8.840 ⁶⁵	77.35 ²¹³
		48	211	51	123	35	71	92	196
	30.4	65.32	79.56	25.302	64.74	30.872	35.82	8.748	79.31
June	9.3	64.78 ⁵⁴	81.24 ¹⁶⁸	25.231 ⁷¹	65.88 ¹¹⁴	30.818 ⁵⁴	35.10 ⁷²	8.630 ¹¹⁸	81.01 ¹⁷⁰
	19.3	64.19 ⁵⁹	82.42 ¹¹⁸	25.145 ⁸⁶	66.91 ¹⁰⁸	30.746 ⁷²	34.37 ⁷⁸	8.492 ¹³⁸	82.42 ¹⁴¹
	29.3	63.56 ⁶³	83.09 ⁶⁷	25.045 ¹⁰⁰	67.80 ⁸⁹	30.660 ⁸⁶	33.67 ⁷⁰	8.338 ¹⁵⁴	83.49 ¹⁰⁷
July	9.3	62.92 ⁶⁴	83.22 ¹³	24.934 ¹¹¹	68.51 ⁷¹	30.561 ⁹⁹	32.99 ⁶⁸	8.171 ¹⁶⁷	84.20 ⁷¹
		65	41	118	58	108	62	174	33
	19.2	62.27	82.81	24.816	69.04	30.453	32.37	7.997	84.53
	29.2	61.63 ⁶⁴	81.86 ⁹⁶	24.695 ¹²¹	69.35 ³¹	30.340 ¹¹³	31.82 ⁵⁵	7.821 ¹⁷⁶	84.47 ⁶
Aug.	8.2	61.01 ⁶²	80.41 ¹⁴⁵	24.574 ¹³¹	69.46 ¹¹	30.225 ¹¹⁵	31.36 ⁴⁶	7.647 ¹⁷⁴	84.02 ⁴⁵
	18.2	60.43 ⁵⁸	78.48 ¹⁹³	24.459 ¹¹⁵	69.32 ¹⁴	30.114 ¹¹¹	31.00 ³⁶	7.481 ¹⁶⁶	83.18 ⁸⁴
	28.1	59.91 ⁵²	76.10 ²³⁸	24.354 ¹⁰⁶	68.96 ³⁶	30.012 ¹⁰²	30.78 ²²	7.328 ¹⁵³	81.95 ¹²³
		46	277	87	61	86	8	133	159
Sept.	7.1	59.45 ³⁶	73.33 ³¹³	24.267 ⁶⁴	68.35 ⁸⁶	29.926 ⁶³	30.70 ⁹	7.195 ¹⁰³	80.36 ¹⁹³
	17.1	59.09 ²⁸	70.20 ³⁴²	24.203 ³⁴	67.49 ¹¹³	29.863 ³⁴	30.79 ³⁰	7.092 ⁶⁹	78.43 ²²⁶
	27.0	58.81 ¹⁸	66.78 ³⁶³	24.169 ¹	66.36 ¹³⁷	29.829 ¹	31.09 ⁵¹	7.023 ²⁹	76.17 ²⁵⁵
Oct.	7.0	58.63 ⁶	63.15 ³⁷⁹	24.170 ⁴²	64.99 ¹⁶³	29.830 ⁴²	31.60 ⁷⁵	6.994 ¹⁹	73.62 ²⁷⁸
	17.0	58.57 ⁷	59.36 ³⁸⁵	24.212 ⁸⁷	63.36 ¹⁸⁶	29.872 ⁸⁷	32.35 ⁹⁹	7.013 ⁷⁰	70.84 ²⁹⁹
	27.0	58.64	55.51	24.299	61.50	29.959	33.34	7.083	67.85
Nov.	5.9	58.83 ¹⁹	51.68 ³⁸³	24.432 ¹³³	59.41 ²⁰⁹	30.093 ¹³⁴	34.60 ¹²⁶	7.207 ¹²⁴	64.73 ³¹²
	15.9	59.15 ³²	47.97 ³⁷¹	24.612 ¹⁸⁰	57.16 ²³⁵	30.273 ¹⁸⁰	36.08 ¹⁴⁸	7.386 ¹⁷⁹	61.54 ³¹⁹
	25.9	59.59 ⁴⁴	44.47 ³⁵⁰	24.837 ²²⁵	54.78 ²³⁸	30.497 ²²⁴	37.80 ¹⁷²	7.618 ²³²	58.36 ³¹⁸
Dec.	5.9	60.15 ⁵⁶	41.29 ³¹⁸	25.101 ²⁶⁴	52.33 ²⁴⁵	30.759 ²⁶²	39.68 ¹⁸⁸	7.897 ²⁷⁹	55.29 ³⁰⁷
		66	277	296	245	294	201	320	290
	15.8	60.80	38.52	25.397	49.88	31.053	41.69	8.217	52.39
	25.8	61.53 ⁷⁸	36.24 ²²⁸	25.715 ³¹⁸	47.50 ²³⁸	31.369 ³¹⁶	43.78 ²⁰⁹	8.568 ³⁵¹	49.79 ²⁶⁰
	35.8	62.32 ⁷⁹	34.54 ¹⁷⁰	26.047 ³³²	45.27 ²²³	31.697 ³²⁸	45.87 ²⁰⁹	8.938 ³⁷⁰	47.55 ²²⁴
Mean Place		60.915	79.90	22.227	78.23	27.735	18.77	5.572	86.55
Sec δ, Tan δ		3.385	+3.234	1.032	+0.253	1.000	-0.003	1.262	+0.770
Dψ α, Dα α		+0.03	+0.20	+0.06	+0.02	+0.06	0.00	+0.05	+0.05
Dψ δ, Dδ δ		-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Centauri. Mag. 2.6		m Virginis. Mag. 5.2		τ Boötis. Mag. 4.5		η Ursæ Majoris. (Alkaid.) Mag. 1.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 34	° ' " -53 2	h m 13 37	° ' " - 8 17	h m 13 43	° ' " +17 51	h m 13 44	° ' " +49 42
Jan. 0.8	37.607	34.11	15.868	10.32	19.678	57.21	16.726	74.54
10.8	38.113	35.32	16.207	12.31	20.015	55.08	17.155	72.56
20.7	38.610	36.96	16.542	14.28	20.351	53.22	17.591	71.15
30.7	39.089	38.98	16.865	16.18	20.678	51.72	18.019	70.33
Feb. 9.7	39.536	41.31	17.167	17.94	20.985	50.62	18.425	70.13
19.7	39.943	43.89	17.442	19.51	21.266	49.94	18.798	70.54
Mar. 1.6	40.303	46.64	17.684	20.87	21.515	49.69	19.127	71.54
11.6	40.613	49.51	17.893	21.99	21.729	49.84	19.404	73.05
21.6	40.872	52.42	18.067	22.88	21.905	50.36	19.627	75.01
31.5	41.078	55.32	18.207	23.52	22.045	51.21	19.793	77.31
Apr. 10.5	41.232	58.15	18.313	23.95	22.148	52.33	19.901	79.86
20.5	41.336	60.86	18.388	24.17	22.217	53.64	19.953	82.55
30.5	41.391	63.40	18.436	24.22	22.253	55.08	19.951	85.28
May 10.4	41.399	65.72	18.455	24.11	22.261	56.58	19.903	87.94
20.4	41.363	67.78	18.451	23.86	22.242	58.09	19.810	90.44
30.4	41.284	69.55	18.424	23.52	22.200	59.55	19.677	92.70
June 9.4	41.167	71.00	18.377	23.09	22.134	60.91	19.511	94.64
19.3	41.014	72.08	18.310	22.60	22.051	62.11	19.318	96.23
29.3	40.832	72.77	18.228	22.05	21.951	63.15	19.102	97.41
July 9.3	40.623	73.05	18.132	21.46	21.836	63.99	18.870	98.16
19.2	40.396	72.93	18.024	20.86	21.712	64.60	18.627	98.45
29.2	40.159	72.40	17.909	20.24	21.581	64.97	18.380	98.28
Aug. 8.2	39.921	71.47	17.792	19.64	21.447	65.08	18.135	97.64
18.2	39.691	70.17	17.678	19.07	21.317	64.93	17.898	96.55
28.1	39.482	68.55	17.572	18.55	21.196	64.52	17.679	95.02
Sept. 7.1	39.305	66.66	17.481	18.12	21.089	63.82	17.483	93.08
17.1	39.170	64.55	17.414	17.81	21.003	62.86	17.320	90.76
27.1	39.088	62.32	17.375	17.66	20.947	61.61	17.198	88.09
Oct. 7.0	39.070	60.06	17.371	17.69	20.926	60.08	17.123	85.12
17.0	39.123	57.86	17.410	17.94	20.945	58.31	17.104	81.91
27.0	39.251	55.82	17.494	18.42	21.009	56.29	17.146	78.51
Nov. 5.9	39.454	54.03	17.626	19.17	21.122	54.06	17.250	74.99
15.9	39.732	52.57	17.806	20.18	21.283	51.66	17.420	71.45
25.9	40.077	51.52	18.030	21.46	21.490	49.14	17.655	67.98
Dec. 5.9	40.481	50.93	18.294	22.96	21.739	46.56	17.949	64.66
15.8	40.931	50.83	18.590	24.67	22.023	44.01	18.294	61.60
25.8	41.414	51.23	18.910	26.53	22.336	41.55	18.681	58.89
35.8	41.913	52.12	19.243	28.48	22.664	39.26	19.096	56.62
Mean Place	37.129	41.91	15.201	4.56	19.071	71.79	16.341	97.57
Sec δ , Tan δ	1.664	-1.329	1.011	-0.146	1.051	+0.322	1.547	+1.180
$D\psi\alpha$, $D_\omega\alpha$	+0.08	-0.08	+0.06	-0.01	+0.06	+0.02	+0.05	+0.07
$D\psi\delta$, $D_\omega\delta$	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	89 Virginis. Mag. 5.1		ζ Centauri. Mag. 3.1		77 Boötis. Mag. 2.8		θ Apodis. Var. 5.5-6.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 45	° ' " -17 43	h m 13 50	° ' " -46 52	h m 13 50	° ' " +18 48	h m 13 57	° ' " -76 23
	s	"	s	"	s	"	s	"
Jan. 0.8	22.101	18.71	21.669	43.34	44.523	33.19	11.00	37.57
10.8	22.450 ³⁴⁰	20.53 ¹⁸²	22.126 ⁴⁵⁷	44.50 ¹¹⁶	44.860 ³³⁷	31.00 ²¹⁹	12.14 ¹¹⁴	37.85 ²⁸
20.7	22.798 ³⁴⁸	22.45 ¹⁹²	22.579 ⁴⁵³	46.05 ¹⁵⁵	45.198 ³³⁸	29.11 ¹⁸⁰	13.27 ¹¹²	38.70 ⁸⁵
30.7	23.134 ³³⁶	24.39 ¹⁹⁴	23.017 ⁴³⁸	47.92 ¹⁸⁷	45.528 ³³⁰	27.59 ¹⁸²	14.39 ¹¹²	40.12 ¹⁴²
Feb. 9.7	23.448 ³¹⁴	26.30 ¹⁹¹	23.432 ⁴¹⁵	50.06 ²¹⁴	45.839 ³¹¹	26.48 ¹¹¹	15.45 ¹⁰⁸	42.00 ¹⁸⁸
	280	183	381	285	287	08	99	223
19.7	23.737	28.13	23.813	52.41	46.126	25.80	16.44	44.33
Mar. 1.6	23.994 ²⁶⁷	29.82 ¹⁶⁹	24.156 ³⁴³	54.91 ²⁵⁰	46.381 ²⁶⁵	25.55 ²⁵	17.33 ⁸⁹	47.05 ²⁷²
	223	164	300	250	221	17	79	301
11.6	24.217	31.36	24.456	57.49	46.802	25.72	18.12	50.06
21.6	24.406 ¹⁸⁹	32.72 ¹³⁶	24.711 ²⁵⁵	60.09 ²⁸⁰	46.787 ¹⁸⁵	26.27 ⁵⁵	18.79 ⁶⁷	53.29 ³²³
31.6	24.560 ¹⁵⁴	33.88 ¹¹⁶	24.921 ²¹⁰	62.66 ²⁵⁷	46.934 ¹⁴⁷	27.15 ⁸⁸	19.34 ⁵⁵	56.68 ³³⁹
	120	97	165	251	111	117	41	346
Apr. 10.5	24.680	34.85	25.086	65.17	47.045	28.32	19.75	60.14
20.5	24.770 ⁹⁰	35.62 ⁷⁷	25.207 ¹²¹	67.56 ²³⁹	47.122 ⁷⁷	29.68 ¹³⁶	20.08 ²⁸	63.61 ³⁴⁷
30.5	24.829 ⁵⁹	36.23 ⁶¹	25.286 ⁷⁹	69.79 ²²³	47.167 ⁴⁵	31.17 ¹⁴⁹	20.17 ¹⁴	67.00 ³³⁹
May 10.4	24.860 ³¹	36.66 ⁴³	25.323 ³⁷	71.83 ²⁰⁴	47.181 ¹⁴	32.73 ¹⁵⁶	20.18 ¹	70.25 ³²⁵
20.4	24.865 ⁵	36.92 ²⁶	25.321 ²	73.65 ¹⁸²	47.168 ¹³	34.30 ¹⁵⁷	20.06 ¹²	73.29 ³⁰⁴
	20	12	40	156	38	152	25	281
30.4	24.845	37.04	25.281	75.21	47.130	35.82	19.81	76.10
June 9.4	24.808 ⁴²	37.01 ³	25.204 ⁷⁷	76.48 ¹²⁷	47.070 ⁶⁰	37.23 ¹⁴¹	19.44 ³⁷	78.52 ²⁴²
19.3	24.739 ⁶⁴	36.83 ¹⁸	25.094 ¹¹⁰	77.45 ⁹⁷	46.989 ⁸¹	38.50 ¹²⁷	18.97 ⁴⁷	80.58 ²⁰⁶
29.3	24.656 ⁸³	36.53 ³⁰	24.956 ¹³⁸	78.07 ⁶²	46.890 ⁹⁹	39.58 ¹⁰⁸	18.39 ⁵⁸	82.18 ¹⁶⁰
July 9.3	24.557 ⁹⁹	36.12 ⁴¹	24.791 ¹⁶⁵	78.34 ²⁷	46.776 ¹¹⁴	40.45 ¹¹⁴	17.74 ⁶⁵	83.33 ¹¹⁵
	112	53	185	9	125	63	70	60
19.3	24.445	35.59	24.606	78.25	46.651	41.08	17.04	83.93
29.2	24.323 ¹²²	34.97 ⁶²	24.408 ¹⁹⁸	77.82 ⁴³	46.518 ¹³³	41.47 ³⁹	16.29 ⁷⁵	84.00 ⁷
Aug. 8.2	24.197 ¹²⁶	34.25 ⁷²	24.204 ³⁰⁴	77.02 ⁸⁰	46.381 ¹³⁷	41.59 ¹²	15.54 ⁷⁵	83.54 ⁴⁶
18.2	24.072 ¹²⁵	33.48 ⁷⁷	24.003 ³⁰¹	75.90 ¹¹²	46.247 ¹²⁴	41.43 ¹⁶	14.81 ⁷³	82.55 ⁹⁹
28.1	23.956 ¹¹⁶	32.69 ⁷⁹	23.815 ¹⁸⁸	74.50 ¹⁴⁰	46.120 ¹²⁷	41.01 ⁴²	14.12 ⁶⁹	81.05 ¹⁵⁰
	101	79	164	166	113	72	60	195
Sept. 7.1	23.855	31.90	23.651	72.84	46.007	40.29	13.52	79.10
17.1	23.777 ⁷⁸	31.16 ⁷⁴	23.521 ¹³⁰	71.00 ¹⁸⁴	45.915 ⁹²	39.30 ⁹⁹	13.02 ⁵⁰	76.78 ²³²
27.1	23.729 ⁴⁸	30.51 ⁶⁵	23.436 ⁸⁵	69.06 ¹⁹⁴	45.851 ⁶⁴	38.01 ¹²⁹	12.65 ³⁷	74.14 ²⁶⁴
Oct. 7.0	23.719 ¹⁰	29.99 ⁵²	23.405 ³¹	67.08 ¹⁹⁸	45.822 ²⁹	36.45 ¹⁵⁶	12.44 ²¹	71.30 ²⁸⁴
17.0	23.753 ³⁴	29.66 ³³	23.434 ²⁹	65.16 ¹⁹²	45.834 ¹²	34.63 ¹⁸²	12.41 ³	68.34 ²⁹⁶
	81	11	97	178	57	207	14	294
27.0	23.834	29.55	23.531	63.38	45.891	32.56	12.55	65.40
Nov. 6.0	23.965 ¹³¹	29.71 ¹⁶	23.695 ¹⁶⁴	61.83 ¹⁵⁵	45.995 ¹⁰⁴	30.28 ²²⁸	12.89 ³⁴	62.60 ²⁸⁰
15.9	24.146 ¹⁸¹	30.14 ⁴³	23.928 ²³³	60.59 ¹²⁴	46.149 ¹⁵⁴	27.83 ²⁴⁵	13.40 ⁵¹	60.04 ²⁵⁶
25.9	24.374 ²²⁸	30.88 ⁷⁴	24.223 ²⁸⁵	59.72 ⁸⁷	46.350 ²⁰¹	25.25 ²⁶⁸	14.09 ⁶⁹	57.83 ²²¹
Dec. 5.9	24.644 ²⁷⁰	31.90 ¹⁰²	24.573 ³⁵⁰	59.25 ⁴⁷	46.595 ²⁴⁵	22.63 ²⁵²	14.92 ⁸³	56.08 ¹⁷⁵
	305	131	396	1	280	260	96	125
15.8	24.949	33.21	24.969	59.24	46.875	20.03	15.88	54.83
25.8	25.277 ³²⁸	34.74 ¹⁵³	25.397 ⁴²⁸	59.68 ⁴⁴	47.185 ³¹⁰	17.53 ²⁵⁰	16.92 ¹⁰⁴	54.14 ⁶⁹
35.8	25.621 ³⁴⁴	36.46 ¹⁷²	25.845 ⁴⁴⁸	60.57 ⁸⁹	47.512 ³²⁷	15.20 ²³³	18.03 ¹¹¹	54.05 ⁹
Mean Place	21.487	16.12	21.223	49.39	43.968	47.97	11.699	48.82
Sec δ, Tan δ	1.050	-0.320	1.463	-1.068	1.056	+0.341	4.253	-4.134
D _α α, D _α α	+0.06	-0.02	+0.07	-0.06	+0.06	+0.02	+0.11	-0.24
D _δ δ, D _α δ	-0.4	-0.4	-0.4	-0.5	-0.4	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Boötis. Mag. 6.1		♌ Virginis. Mag. 4.3		β Centauri. Mag. 0.9		π Hydræ. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 57	° ' " +27 46	h m 13 57	° ' " +1 56	h m 13 57	° ' " -59 58	h m 14 1	° ' " -26 16
Jan. 0.8	25.195	55.66	25.821	35.33	57.425	14.73	38.954	59.14
10.8	25.542 ³⁴⁷	53.45 ²²¹	26.151 ³³⁰	33.27 ²⁰⁶	58.012 ⁵⁸⁷	15.45 ⁷²	39.320 ³⁶⁶	60.69 ¹⁵⁵
20.7	25.893 ³⁵¹	51.62 ¹⁸³	26.482 ³³¹	31.33 ¹⁹⁴	58.599 ⁵⁸⁷	16.65 ¹²⁰	39.686 ³⁶⁶	62.43 ¹⁷⁴
30.7	26.238 ³⁴⁵	50.23 ¹³⁹	26.804 ³²²	29.57 ¹⁷⁶	59.172 ⁵⁷³	18.29 ¹⁶⁴	40.042 ³⁵⁶	64.28 ¹⁸⁵
Feb. 9.7	26.566 ³²⁸	49.32 ⁹¹	27.109 ³⁰⁵	28.06 ¹⁵¹	59.716 ⁵⁴⁴	20.32 ²⁰⁸	40.381 ³³⁹	66.21 ¹⁹³
19.7	26.868 ³⁰²	48.92 ⁴⁰	27.392 ²⁸³	26.83 ¹²³	60.221 ⁵⁰⁵	22.67 ²³⁵	40.694 ³¹³	68.14 ¹⁹³
Mar. 1.6	27.139 ²⁷¹	49.02 ¹⁰	27.644 ²⁵²	25.90 ⁹³	60.678 ⁴⁵⁷	25.30 ²⁶³	40.979 ²⁸⁵	70.04 ¹⁹⁰
11.6	27.375 ²³⁶	49.58 ⁵⁶	27.865 ²²¹	25.29 ⁶¹	61.081 ⁴⁰³	28.10 ²⁸⁰	41.229 ²⁵⁰	71.85 ¹⁸¹
21.6	27.572 ¹⁹⁷	50.55 ⁹⁷	28.055 ¹⁹⁰	24.98 ³¹	61.427 ³⁴⁶	31.03 ²⁹³	41.444 ²¹⁵	73.55 ¹⁷⁰
31.6	27.729 ¹⁵⁷	51.90 ¹³⁵	28.209 ¹⁵⁴	24.94 ⁴	61.712 ²⁸⁵	34.03 ³⁰⁰	41.625 ¹⁸¹	75.12 ¹⁵⁷
	118	164	122	23	225	300	147	142
Apr. 10.5	27.847 ⁷⁹	53.54 ¹⁸³	28.331 ⁹²	25.17 ⁴²	61.937 ¹⁶⁴	37.03 ²⁹⁴	41.772 ¹¹²	76.54 ¹²⁶
20.5	27.926 ⁴⁵	55.37 ¹⁹⁵	28.423 ⁶¹	25.59 ⁵⁹	62.101 ¹⁰⁴	39.97 ²⁸³	41.884 ⁸²	77.80 ¹⁰⁷
30.5	27.971 ¹¹	57.32 ²⁰⁰	28.484 ³⁴	26.18 ⁷³	62.205 ⁴⁴	42.80 ²⁶⁵	41.966 ⁵¹	78.87 ⁹¹
May 10.4	27.982 ²⁰	59.32 ¹⁹⁷	28.518 ⁹	26.91 ⁸⁰	62.249 ¹⁴	45.45 ²⁴⁵	42.017 ²¹	79.78 ⁷³
20.4	27.962 ⁴⁷	61.29 ¹⁸⁷	28.527 ¹⁶	27.71 ⁸⁵	62.235 ⁶⁹	47.90 ²¹⁷	42.038 ⁶	80.51 ⁵⁷
30.4	27.915 ⁷⁴	63.16 ¹⁷⁰	28.511 ³⁸	28.56 ⁸⁶	62.166 ¹²²	50.07 ¹⁸⁶	42.032 ³⁵	81.08 ³⁸
June 9.4	27.841 ⁹⁵	64.86 ¹⁵⁰	28.473 ⁵⁸	29.42 ⁸⁴	62.044 ¹⁷¹	51.93 ¹⁵¹	41.997 ⁸⁸	81.46 ¹⁹
19.3	27.746 ¹¹⁶	66.36 ¹²⁴	28.415 ⁷³	30.26 ⁸¹	61.873 ²¹⁶	53.44 ¹¹¹	41.939 ⁵³	81.65 ¹
29.3	27.630 ¹³²	67.60 ⁹⁶	28.337 ⁹⁴	31.07 ⁷³	61.657 ²⁵²	54.55 ⁹⁹	41.858 ¹⁰²	81.66 ¹⁹
July 9.3	27.498 ¹⁴⁴	68.56 ⁶⁵	28.243 ¹⁰⁷	31.80 ⁶⁶	61.405 ²⁸¹	55.24 ²⁵	41.754 ¹²⁰	81.47 ³⁴
19.3	27.354 ¹⁵³	69.21 ³²	28.136 ¹¹⁸	32.46 ⁵⁶	61.124 ³⁰²	55.49 ¹⁹	41.634 ¹³²	81.13 ⁵⁴
29.2	27.201 ¹⁵⁶	69.53 ⁰	28.018 ¹²²	33.02 ⁴⁵	60.822 ³⁰⁹	55.30 ⁶⁴	41.502 ¹⁴¹	80.59 ⁷⁰
Aug. 8.2	27.045 ¹⁵⁵	69.53 ³⁶	27.896 ¹²³	33.47 ³²	60.513 ³⁰⁴	54.66 ¹⁰⁸	41.361 ¹⁴⁰	79.89 ⁸³
18.2	26.890 ¹⁴⁸	69.17 ⁶⁹	27.773 ¹¹⁷	33.79 ¹⁷	60.209 ²⁸⁷	53.58 ¹⁴⁷	41.221 ¹³⁵	79.06 ⁹⁵
28.1	26.742 ¹³³	68.48 ¹⁰⁴	27.666 ¹⁰⁵	33.96 ¹	59.922 ²⁵³	52.11 ¹⁸¹	41.086 ¹²⁰	78.11 ¹⁰²
Sept. 7.1	26.609 ¹¹⁰	67.44 ¹³⁵	27.551 ⁸⁵	33.97 ¹⁸	59.669 ²⁰⁶	50.30 ²¹¹	40.966 ¹⁰⁰	77.09 ¹⁰⁶
17.1	26.499 ⁸²	63.09 ¹⁶⁹	27.466 ⁵⁸	33.79 ³⁷	59.463 ¹⁴⁵	48.19 ²³²	40.866 ⁶⁵	76.03 ¹⁰⁴
27.1	26.417 ⁴⁷	64.40 ¹⁹⁹	27.408 ²⁵	33.42 ⁶¹	59.318 ⁷³	45.87 ²⁴⁴	40.801 ²⁸	74.99 ⁹⁷
Oct. 7.0	26.370 ⁴	62.41 ²²⁵	27.383 ¹⁵	32.81 ⁸³	59.245 ¹⁰	43.43 ²⁴⁷	40.773 ¹⁷	74.02 ⁸⁴
17.0	26.366 ⁴³	60.16 ²⁵¹	27.398 ⁵⁹	31.98 ¹⁰⁸	59.255 ⁹⁹	40.96 ²³⁹	40.790 ⁶⁹	73.18 ⁶⁵
27.0	26.409 ⁹⁵	57.65 ²⁶⁹	27.457 ¹⁰⁷	30.90 ¹⁸¹	59.354 ¹⁹¹	38.57 ²²⁰	40.859 ¹²²	72.53 ⁴²
Nov. 6.0	26.504 ¹⁴⁵	54.96 ²⁸⁴	27.564 ¹⁵⁰	29.59 ¹⁵⁶	59.545 ²⁸²	36.37 ¹⁹³	40.981 ¹⁷⁶	72.11 ¹²
15.9	26.649 ¹⁹⁵	52.12 ²⁹²	27.718 ²⁰⁴	28.03 ¹⁷⁶	59.827 ³⁶⁵	34.44 ¹⁵⁶	41.157 ²²⁷	71.99 ¹⁸
25.9	26.844 ²⁴²	49.20 ²⁸²	27.918 ²⁴²	26.27 ¹⁹²	60.192 ⁴³⁹	32.88 ¹¹³	41.384 ²⁷³	72.17 ⁴⁹
Dec. 5.9	27.086 ²⁸²	46.28 ²⁸³	28.160 ²⁷⁶	24.35 ²⁰⁴	60.631 ⁵⁰¹	31.75 ⁶⁵	41.657 ³¹¹	72.66 ⁸³
15.8	27.368 ³¹⁵	43.45 ²⁶⁵	28.436 ³⁰⁵	22.31 ²¹⁰	61.132 ⁵⁴⁷	31.10 ¹³	41.968 ³³⁹	73.49 ¹¹³
25.8	27.683 ³³⁵	40.80 ²⁴¹	28.741 ³²¹	20.21 ²⁰⁹	61.679 ⁵⁷⁵	30.97 ³⁸	42.307 ³⁵⁹	74.62 ¹³⁸
35.8	28.018	38.39	29.062	18.12	62.254	31.35	42.666	76.00
Mean Place	24.729	73.03	25.268	44.56	57.232	23.52	38.444	59.18
Sec δ, Tan δ	1.130	+0.527	1.001	+0.034	1.999	-1.730	1.115	-0.494
Dψ α, Dω α	+0.05	+0.03	+0.06	0.00	+0.08	-0.10	+0.07	-0.03
Dψ δ, Dω δ	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Centauri. Mag. 2.3		α Draconis. Mag. 3.6		δ Boötis. Mag. 4.8		κ Virginis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 1	° ' " -35 57	h m 14 2	° ' " +64 45	h m 14 6	° ' " +25 28	h m 14 8	° ' " - 9 53
Jan. 0.8	47.982	40.91	8.29	55.03	37.278	46.75	28.455	21.85
10.8	48.379 ³⁹⁷	42.23 ¹³²	8.86 ⁵⁷	53.08 ¹⁹⁵	37.818 ³⁴⁰	44.50 ²²⁵	28.791 ³³⁶	23.70 ¹⁸⁵
20.8	48.776 ³⁹⁷	43.84 ¹⁶¹	9.45 ⁵⁹	51.75 ¹³³	37.963 ³⁴⁵	42.59 ¹⁹¹	29.129 ³³⁸	25.56 ¹⁸⁶
30.7	49.162 ³⁸⁶	45.67 ¹⁸³	10.05 ⁶⁰	51.07 ⁶⁸	38.304 ³⁴¹	41.11 ¹⁴⁸	29.459 ³³⁰	27.36 ¹⁸⁰
Feb. 9.7	49.529 ³⁶⁷	47.67 ²⁰⁰	10.63 ⁵⁸	51.08 ¹	38.630 ³²⁶	40.10 ¹⁰¹	29.774 ³¹⁵	29.04 ¹⁶⁸
19.7	49.869 ³⁴⁰	49.79 ²¹²	11.17 ⁵⁴	51.73 ⁶⁵	38.933 ³⁰³	39.57 ⁵³	30.066 ²⁹²	30.58 ¹⁵⁴
Mar. 1.6	50.176 ³⁰⁷	51.95 ²¹⁶	11.65 ⁴⁸	53.00 ¹²⁷	39.208 ²⁷⁵	39.53 ⁴	30.331 ²⁶⁵	31.92 ¹³⁴
11.6	50.447 ²⁷¹	54.12 ²¹⁷	12.06 ⁴¹	54.83 ¹⁸³	39.447 ²³⁹	39.96 ⁴³	30.567 ²³⁶	33.03 ¹¹¹
21.6	50.682 ²³⁵	56.24 ²¹²	12.39 ³³	57.13 ²³⁰	39.650 ²⁰³	40.81 ⁸⁵	30.770 ²⁰³	33.92 ⁸⁹
31.6	50.878 ¹⁹⁶	58.29 ²⁰⁵	12.64 ²⁶	59.80 ²⁶⁷	39.815 ¹⁶⁵	42.03 ¹²²	30.940 ¹⁷⁰	34.58 ⁶⁶
Apr. 10.5	51.037 ¹⁵⁹	60.24 ¹⁹⁵	12.81 ¹⁷	62.71 ²⁹¹	39.942 ¹²⁷	43.53 ¹⁵⁰	31.080 ¹⁴⁰	35.03 ⁴⁵
20.5	51.159 ¹²²	62.05 ¹⁸¹	12.88 ⁷	65.78 ³⁰⁷	40.034 ⁹²	45.27 ¹⁷⁴	31.188 ¹⁰⁸	35.28 ²⁵
30.5	51.245 ⁸⁶	63.69 ¹⁶⁴	12.87 ¹	68.85 ³⁰⁷	40.089 ⁵⁵	47.14 ¹⁸⁷	31.267 ⁷⁹	35.37 ⁹
May 10.5	51.298 ⁵³	65.17 ¹⁴⁸	12.78 ⁹	71.84 ²⁹⁹	40.112 ²³	49.07 ¹⁹³	31.319 ⁵²	35.30 ⁷
20.4	51.316 ¹⁸	66.46 ¹²⁹	12.60 ¹⁸	74.65 ²⁸¹	40.105 ⁷	50.99 ¹⁹²	31.343 ²⁴	35.10 ²⁰
30.4	51.303 ¹³	67.52 ¹⁰⁶	12.36 ²⁴	77.17 ²⁵²	40.068 ³⁷	52.84 ¹⁸⁵	31.343 ⁰	34.80 ³⁰
June 9.4	51.260 ⁴³	68.37 ⁸⁵	12.07 ²⁹	79.33 ²¹⁶	40.006 ⁶²	54.54 ¹⁷⁰	31.317 ²⁶	34.42 ³⁸
19.3	51.186 ⁷⁴	68.96 ⁵⁹	11.73 ³⁴	81.08 ¹⁷⁵	39.921 ⁸⁵	56.05 ¹⁵¹	31.269 ⁴⁸	33.98 ⁴⁴
29.3	51.088 ⁹⁸	69.30 ³⁴	11.35 ³⁸	82.37 ¹²⁹	39.815 ¹⁰⁶	57.32 ¹²⁷	31.199 ⁷⁹	33.48 ⁵⁰
July 9.3	50.965 ¹²³	69.39 ⁹	10.93 ⁴²	83.16 ⁷⁹	39.691 ¹²⁴	58.34 ¹⁰²	31.110 ⁸⁰	32.94 ⁵⁴
19.3	50.823 ¹⁴²	69.20 ¹⁹	10.50 ⁴³	83.44 ²⁸	39.553 ¹³⁸	59.06 ⁷²	31.006 ¹⁰⁴	32.37 ⁵⁷
29.2	50.668 ¹⁵⁵	68.76 ⁴⁴	10.07 ⁴³	83.20 ²⁴	39.405 ¹⁴⁸	59.49 ⁴³	30.888 ¹¹⁸	31.78 ⁵⁹
Aug. 8.2	50.503 ¹⁶⁵	68.06 ⁷⁰	9.63 ⁴⁴	82.44 ⁷⁶	39.251 ¹⁵⁴	59.58 ⁹	30.763 ¹²⁵	31.20 ⁵⁸
18.2	50.339 ¹⁶⁴	67.13 ⁹³	9.20 ⁴³	81.17 ¹²⁷	39.097 ¹⁵⁴	59.34 ²⁴	30.636 ¹²⁷	30.63 ⁵⁷
28.2	50.182 ¹⁵⁷	65.99 ¹¹⁴	8.80 ⁴⁰	79.42 ¹⁷⁵	38.949 ¹⁴⁸	58.78 ⁵⁶	30.513 ¹²⁸	30.10 ⁵³
Sept. 7.1	50.042 ¹⁴⁰	64.69 ¹³⁰	8.43 ³⁷	77.22 ²²⁰	38.813 ¹³⁶	57.89 ⁸⁹	30.402 ¹¹¹	29.64 ⁴⁶
17.1	49.929 ¹¹³	63.28 ¹⁴¹	8.11 ³²	74.61 ²⁶¹	38.699 ¹¹⁴	56.67 ¹²²	30.309 ⁹³	29.27 ³⁷
27.1	49.851 ⁷⁸	61.82 ¹⁴⁶	7.85 ²⁶	71.63 ²⁹⁸	38.610 ⁸⁹	55.13 ¹⁵⁴	30.243 ⁶⁶	29.03 ²⁴
Oct. 7.0	49.816 ³⁵	60.38 ¹⁴⁴	7.67 ¹⁸	68.35 ³²⁸	38.557 ⁵³	53.30 ¹⁸³	30.211 ³²	28.94 ⁹
17.0	49.832 ¹⁶	59.02 ¹³⁶	7.55 ¹²	64.82 ³⁵³	38.545 ¹²	51.18 ²¹²	30.220 ²¹²	29.05 ¹¹
27.0	49.904 ⁷²	57.82 ¹²⁰	7.52 ³	61.12 ³⁷⁰	38.580 ³⁵	48.82 ²³⁶	30.274 ⁵⁴	29.38 ³³
Nov. 6.0	50.036 ¹³²	56.84 ⁹⁸	7.58 ⁶	57.33 ³⁷⁹	38.664 ⁸⁴	46.23 ²⁵⁹	30.376 ¹⁰²	29.95 ⁵⁷
15.9	50.227 ¹⁹¹	56.16 ⁶⁸	7.74 ¹⁶	53.54 ³⁷⁹	38.799 ¹³⁵	43.49 ²⁷⁴	30.528 ¹⁵²	30.78 ⁸³
25.9	50.473 ²⁴⁶	55.80 ³⁶	8.00 ²⁶	49.84 ³⁷⁰	38.985 ¹⁸⁶	40.66 ²⁶³	30.727 ¹⁹⁹	31.87 ¹⁰⁹
Dec. 5.9	50.769 ²⁹⁶	55.80 ⁰	8.34 ³⁴	46.36 ³⁴⁸	39.217 ²³²	37.80 ²⁸⁶	30.970 ²⁴³	33.18 ¹³¹
15.9	51.106 ³³⁷	56.19 ³⁹	8.76 ⁴²	43.18 ³¹⁸	39.490 ²⁷³	34.99 ²⁸¹	31.249 ²⁷⁹	34.71 ¹⁵³
25.8	51.473 ³⁶⁷	56.95 ⁷⁶	9.25 ⁴⁹	40.40 ²⁷⁸	39.796 ³⁰⁶	32.34 ²⁶⁵	31.557 ³⁰⁸	36.39 ¹⁶⁸
35.8	51.860 ³⁸⁷	58.05 ¹¹⁰	9.79 ⁵⁴	38.12 ²²⁸	40.124 ³²⁸	29.91 ²⁴³	31.883 ³²⁶	38.18 ¹⁷⁹
Mean Place	47.518	43.84	8.553	80.01	36.864	63.30	27.955	16.58
Sec δ , Tan δ	1.235	-0.726	2.346	+2.122	1.108	+0.476	1.015	-0.174
$D\psi\alpha$, $D\omega\alpha$	+0.07	-0.04	+0.03	+0.12	+0.05	+0.03	+0.06	-0.01
$D\psi\delta$, $D\omega\delta$	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 Ursæ Minoris. Mag. 5.0		ι Virginis. Mag. 4.2		α Boötis. (Arcturus.) Mag. 0.2		λ Boötis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 9	° ' " +77 55	h m 14 11	° ' " - 5 36	h m 14 11	° ' " +19 36	h m 14 13	° ' " +46 27
	s	"	s	"	s	"	s	"
Jan. 0.8	7.19	49.09	40.075	24.49	52.913	35.66	13.934	46.66
10.8	8.21	47.31	40.405	26.43	53.242	33.36	14.330	44.40
20.8	9.30	46.15	40.739	28.32	53.577	31.36	14.739	42.65
30.7	10.40	45.67	41.067	30.12	53.907	29.73	15.148	41.48
Feb. 9.7	11.49	45.86	41.378	31.75	54.224	28.51	15.543	40.92
19.7	12.51	46.72	41.669	33.19	54.519	27.73	15.915	40.98
Mar. 1.6	13.44	48.20	41.934	34.38	54.786	27.40	16.251	41.63
11.6	14.24	50.23	42.169	35.32	55.022	27.51	16.545	42.83
21.6	14.88	52.72	42.371	36.00	55.223	28.01	16.792	44.52
31.6	15.35	55.54	42.542	36.45	55.389	28.88	16.988	46.62
Apr. 10.5	15.62	58.61	42.683	36.65	55.519	30.04	17.133	49.02
20.5	15.72	61.79	42.791	36.66	55.615	31.42	17.226	51.64
30.5	15.62	64.96	42.871	36.49	55.678	32.96	17.270	54.36
May 10.5	15.36	68.01	42.923	36.18	55.710	34.60	17.266	57.07
20.4	14.94	70.84	42.948	35.76	55.714	36.23	17.220	59.68
30.4	14.36	73.36	42.949	35.26	55.689	37.83	17.132	62.13
June 9.4	13.65	75.49	42.924	34.70	55.639	39.34	17.008	64.32
19.3	12.84	77.18	42.877	34.10	55.565	40.70	16.852	66.19
29.3	11.95	78.37	42.808	33.49	55.472	41.86	16.670	67.69
July 9.3	11.00	79.05	42.721	32.87	55.359	42.82	16.464	68.79
19.3	10.01	79.19	42.617	32.27	55.231	43.53	16.242	69.46
29.2	9.00	78.78	42.500	31.70	55.092	43.99	16.009	69.68
Aug. 8.2	7.99	77.83	42.376	31.17	54.947	44.16	15.770	69.44
18.2	7.02	76.39	42.249	30.69	54.799	44.04	15.533	68.75
28.2	6.10	74.45	42.125	30.30	54.656	43.65	15.305	67.61
Sept. 7.1	5.26	72.07	42.012	30.02	54.525	42.96	15.096	66.04
17.1	4.51	69.30	41.917	29.85	54.413	41.97	14.911	64.06
27.1	3.89	66.16	41.849	29.83	54.326	40.68	14.761	61.71
Oct. 7.0	3.38	62.73	41.813	30.01	54.272	39.10	14.654	59.02
17.0	3.03	59.09	41.817	30.38	54.259	37.25	14.597	56.03
27.0	2.86	55.31	41.866	30.98	54.290	35.14	14.597	52.82
Nov. 6.0	2.86	51.47	41.963	31.82	54.369	32.81	14.657	49.43
15.9	3.05	47.66	42.108	32.92	54.498	30.29	14.781	45.96
25.9	3.41	43.98	42.301	34.24	54.677	27.65	14.969	42.47
Dec. 5.9	3.95	40.54	42.536	35.77	54.901	24.94	15.216	39.07
15.9	4.66	37.45	42.809	37.49	55.165	22.24	15.516	35.86
25.8	5.51	34.79	43.111	39.32	55.460	19.64	15.861	32.95
35.8	6.48	32.65	43.432	41.23	55.778	17.20	16.240	30.42
Mean Place	9.051	74.88	39.592	17.81	52.501	50.39	13.805	68.27
Sec δ, Tan δ	4.782	+4.677	1.005	-0.098	1.062	+0.356	1.452	+1.052
D _α , D _α α	-0.01	+0.26	+0.06	-0.01	+0.06	+0.02	+0.05	+0.06
D _δ , D _δ δ	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5	-0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Virginis. Mag. 4.6		ϵ Libræ. Mag. 6.3		θ Boötis. Mag. 4.1		f Boötis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 14	° ' " -12 59	h m 14 18	° ' " -11 20	h m 14 22	° ' " +52 13	h m 14 22	° ' " +19 35
Jan. 0.8	37.380	26.98	57.924	12.71	22.235	39.80	36.046	43.59
10.8	37.717 ³³⁷	28.74 ¹⁷⁶	58.258 ³³⁴	14.49 ¹⁷⁸	22.656 ⁴²¹	37.49 ²³¹	36.373 ³²⁷	41.31 ²²⁸
20.8	38.068 ³⁴¹	30.54 ¹⁸⁰	58.597 ³³⁹	16.29 ¹⁸⁰	23.097 ⁴⁴¹	35.72 ¹⁷⁷	36.708 ³³⁵	39.33 ¹⁹⁸
30.7	38.393 ³³⁵	32.33 ¹⁷⁹	58.931 ³³⁴	18.06 ¹⁷⁷	23.542 ⁴⁴⁵	34.54 ¹¹⁸	37.040 ³³²	37.71 ¹⁶²
Feb. 9.7	38.713 ³²⁰	34.03 ¹⁷⁰	59.251 ³²⁰	19.73 ¹⁶⁷	23.976 ⁴³⁴	34.01 ⁵³	37.361 ³²¹	36.50 ¹²¹
19.7	39.012 ²⁹⁹	35.61 ¹⁶⁸	59.549 ²⁹⁸	21.27 ¹⁵⁴	24.386 ⁴¹⁰	34.11 ¹⁰	37.662 ³⁰¹	35.73 ⁷⁷
Mar. 1.7	39.285 ²⁷³	37.03 ¹⁴²	59.823 ²⁷⁴	22.63 ¹³⁶	24.762 ³⁷⁶	34.84 ⁷³	37.938 ²⁷⁶	35.42 ³¹
11.6	39.527 ²⁴²	38.26 ¹²³	60.067 ²⁴⁴	23.77 ¹¹⁴	25.092 ³³⁰	36.14 ¹³⁰	38.183 ²⁴⁵	35.55 ¹³
21.6	39.737 ²¹⁰	39.29 ¹⁰⁸	60.280 ²¹³	24.71 ⁹⁴	25.370 ²⁷⁸	37.95 ¹⁸¹	38.395 ²¹²	36.09 ⁵⁴
31.6	39.917 ¹⁸⁰	40.11 ⁸²	60.462 ¹⁸²	25.43 ⁷²	25.594 ²²⁴	40.19 ²²⁴	38.573 ¹⁷⁸	36.99 ⁹⁰
Apr. 10.5	40.064 ¹⁴⁷	40.72 ⁶¹	60.612 ¹⁶⁰	25.94 ⁵¹	25.760 ¹⁶⁶	42.75 ²⁶⁶	38.717 ¹⁴⁴	38.21 ¹²²
20.5	40.180 ¹¹⁶	41.16 ⁴⁴	60.732 ¹²⁰	26.27 ³³	25.867 ¹⁰⁷	45.52 ²⁷⁷	38.825 ¹⁰⁸	39.66 ¹⁴⁵
30.5	40.268 ⁸⁸	41.41 ²⁵	60.823 ⁹¹	26.41 ¹⁴	25.916 ⁴⁹	48.39 ²⁶⁷	38.901 ⁷⁶	41.28 ¹⁶²
May 10.5	40.326 ⁵⁸	41.52 ¹¹	60.884 ⁶¹	26.42 ¹	25.910 ⁶	51.26 ²⁸⁷	38.946 ⁴⁵	42.99 ¹⁷¹
20.4	40.356 ³⁰	41.49 ³	60.918 ³⁴	26.30 ¹²	25.853 ⁵⁷	54.04 ²⁷⁸	38.960 ¹⁴	44.74 ¹⁷⁵
30.4	40.362 ⁶	41.35 ¹⁴	60.927 ⁹	26.06 ²⁴	25.749 ¹⁰⁴	56.62 ²⁶⁸	38.946 ¹⁴	46.45 ¹⁷¹
June 9.4	40.341 ²¹	41.10 ²⁵	60.909 ¹⁸	25.74 ³²	25.602 ¹⁴⁷	58.94 ²⁸²	38.905 ⁴¹	48.06 ¹⁶⁰
19.4	40.297 ⁴⁴	40.78 ³²	60.868 ⁴¹	25.35 ³⁹	25.418 ¹⁸⁴	60.92 ¹⁹⁸	38.840 ⁶⁵	49.53 ¹⁴⁸
29.3	40.229 ⁶⁸	40.38 ⁴⁰	60.803 ⁶⁵	24.90 ⁴⁵	25.200 ²¹⁸	62.51 ¹⁵⁹	38.753 ⁸⁷	50.82 ¹²⁹
July 9.3	40.142 ⁸⁷	39.91 ⁴⁷	60.718 ⁸⁵	24.41 ⁴⁹	24.956 ²⁴⁴	63.67 ¹¹⁶	38.646 ¹⁰⁷	51.89 ¹⁰⁷
19.3	40.086 ¹⁰⁸	39.39 ⁵²	60.615 ¹⁰³	23.88 ⁵³	24.691 ²⁶⁵	64.37 ⁷⁰	38.521 ¹²⁶	52.73 ⁸⁴
29.2	39.917 ¹¹⁹	38.84 ⁵⁵	60.497 ¹¹⁸	23.31 ⁵⁷	24.412 ²⁷⁹	64.60 ²³	38.384 ¹³⁷	53.29 ⁵⁶
Aug. 8.2	39.791 ¹²⁶	38.25 ⁵⁹	60.371 ¹²⁶	22.74 ⁵⁷	24.127 ²⁸⁵	64.34 ²⁶	38.239 ¹⁴⁵	53.58 ²⁹
18.2	39.661 ¹³⁰	37.64 ⁶¹	60.241 ¹³⁰	22.17 ⁵⁷	23.843 ²⁸⁴	63.60 ⁷⁴	38.090 ¹⁴⁹	53.59 ¹
28.2	39.534 ¹²⁷	37.05 ⁵⁹	60.112 ¹²⁹	21.63 ⁵⁴	23.568 ²⁷⁵	62.39 ¹²¹	37.943 ¹⁴⁷	53.30 ²⁹
Sept. 7.1	39.418 ¹¹⁶	36.49 ⁵⁶	59.995 ¹¹⁷	21.14 ⁴⁹	23.312 ²⁶⁶	60.73 ¹⁶⁶	37.807 ¹³⁶	52.71 ⁵⁹
17.1	39.319 ⁹⁹	36.00 ⁴⁹	59.894 ¹⁰¹	20.72 ⁴²	23.083 ²²⁹	58.64 ²⁰⁹	37.688 ¹¹⁹	51.82 ⁸⁹
27.1	39.248 ⁷¹	35.61 ³⁹	59.819 ⁷⁵	20.42 ³⁰	22.892 ¹⁹¹	56.15 ²⁴⁹	37.593 ⁹⁵	50.63 ¹¹⁹
Oct. 7.1	39.211 ³⁷	35.37 ²⁴	59.778 ⁴¹	20.27 ¹⁵	22.747 ¹⁴⁵	53.32 ²⁸³	37.531 ⁶²	49.15 ¹⁴⁸
17.0	39.214 ³	35.29 ⁸	59.775 ³	20.28 ¹	22.657 ⁹⁰	50.18 ³¹⁴	37.508 ²³	47.38 ¹⁷⁷
27.0	39.263 ⁴⁹	35.43 ¹⁴	59.819 ⁴⁴	20.52 ²⁴	22.628 ²⁹	46.81 ³³⁷	37.529 ²¹	45.36 ²⁰²
Nov. 6.0	39.360 ⁹⁷	35.79 ³⁶	59.913 ⁹⁴	20.98 ⁴⁶	22.667 ³⁹	43.26 ³⁵⁵	37.599 ⁷⁰	43.11 ²²⁵
15.9	39.509 ¹⁴⁹	36.42 ⁶⁸	60.055 ¹⁴²	21.69 ⁷¹	22.776 ¹⁰⁹	39.63 ³⁶³	37.719 ¹²⁰	40.67 ²⁴⁴
25.9	39.706 ¹⁹⁷	37.29 ⁸⁷	60.246 ¹⁹¹	22.65 ⁹⁶	22.955 ¹⁷⁹	36.00 ³⁶³	37.888 ¹⁶⁹	38.08 ²⁵⁹
Dec. 5.9	39.947 ²⁴¹	38.42 ¹¹³	60.481 ²³⁵	23.86 ¹²¹	23.201 ²⁴⁶	32.48 ³⁵²	38.104 ²¹⁶	35.43 ²⁶⁵
15.9	40.225 ²⁷⁸	39.77 ¹³⁵	60.755 ²⁷⁴	25.27 ¹⁴¹	23.509 ³⁰⁸	29.15 ³³³	38.361 ²⁵⁷	32.77 ²⁶⁶
25.8	40.534 ³⁰⁹	41.32 ¹⁵⁵	61.069 ³⁰⁴	26.86 ¹⁵⁹	23.869 ³⁶⁰	26.15 ³⁰⁰	38.651 ²⁹⁰	30.21 ²⁵⁶
35.8	40.861 ³²⁷	43.01 ¹⁶⁹	61.383 ³²⁴	28.57 ¹⁷¹	24.270 ⁴⁰¹	23.55 ²⁶⁰	38.966 ³¹⁵	27.80 ²⁴¹
Mean Place	36.912	22.71	57.478	7.90	22.329	62.20	35.703	58.11
Sec δ , Tan δ	1.026	-0.231	1.020	-0.201	1.633	+1.290	1.061	+0.356
$D\phi\alpha$, $D\alpha\alpha$	+0.06	-0.01	+0.07	-0.01	+0.04	+0.07	+0.06	+0.02
$D\phi\delta$, $D\delta\delta$	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ Virginis. Mag. 5.0		ϵ Ursae Minoris. Mag. 4.4		ρ Boötis. Mag. 3.8		γ Boötis. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 23	° ' " - 1 51	h m 14 27	° ' " + 76 3	h m 14 28	° ' " + 30 43	h m 14 28	° ' " + 38 39
	s	"	s	"	s	"	s	"
Jan. 0.8	55.873	30.98	38.93	29.25	15.423	49.25	44.314	55.50
10.8	56.197	32.94	39.80	27.20	15.763	46.88	44.672	53.10
20.8	56.526	34.83	40.74	25.78	16.114	44.89	45.043	51.15
30.7	56.852	36.58	41.71	25.01	16.464	43.36	45.417	49.72
Feb. 9.7	57.165	38.12	42.67	24.91	16.805	42.34	45.781	48.85
19.7	57.459	39.43	43.58	25.50	17.127	41.84	46.124	48.56
Mar. 1.7	57.728	40.47	44.43	26.73	17.422	41.88	46.440	48.84
11.6	57.970	41.22	45.18	28.54	17.685	42.43	46.723	49.67
21.6	58.181	41.70	45.80	30.84	17.912	43.45	46.965	50.99
31.6	58.362	41.90	46.27	33.55	18.103	44.86	47.165	52.74
Apr. 10.6	58.511	41.87	46.60	36.54	18.254	46.61	47.321	54.83
20.5	58.629	41.61	46.77	39.70	18.366	48.60	47.434	57.16
30.5	58.719	41.18	46.76	42.90	18.441	50.77	47.505	59.64
May 10.5	58.780	40.62	46.61	46.04	18.480	53.00	47.534	62.17
20.4	58.812	39.95	46.32	49.00	18.486	55.22	47.525	64.66
30.4	58.820	39.21	45.88	51.70	18.458	57.35	47.480	67.04
June 9.4	58.802	38.45	45.33	54.06	18.400	59.34	47.401	69.22
19.4	58.762	37.67	44.68	56.00	18.315	61.12	47.291	71.14
29.3	58.697	36.92	43.95	57.47	18.205	62.64	47.155	72.75
July 9.3	58.614	36.21	43.15	58.44	18.073	63.86	46.994	74.02
19.3	58.512	35.54	42.30	58.88	17.923	64.76	46.815	74.90
29.3	58.395	34.95	41.43	58.79	17.758	65.30	46.621	75.39
Aug. 8.2	58.269	34.43	40.55	58.16	17.585	65.48	46.419	75.45
18.2	58.138	34.00	39.68	57.01	17.409	65.29	46.214	75.10
28.2	58.008	33.70	38.85	55.35	17.235	64.73	46.013	74.33
Sept. 7.1	57.888	33.54	38.08	53.23	17.072	63.80	45.824	73.14
17.1	57.784	33.51	37.37	50.68	16.927	62.50	45.656	71.56
27.1	57.705	33.67	36.76	47.74	16.809	60.85	45.515	69.60
Oct. 7.1	57.656	34.02	36.26	44.49	16.724	58.87	45.412	67.30
17.0	57.646	34.58	35.90	40.97	16.680	56.60	45.353	64.68
27.0	57.680	35.38	35.67	37.28	16.684	54.05	45.344	61.81
Nov. 6.0	57.763	36.41	35.60	33.45	16.739	51.28	45.391	58.71
16.0	57.893	37.69	35.69	29.62	16.847	48.34	45.495	55.48
25.9	58.071	39.17	35.94	25.88	17.009	45.30	45.657	52.18
Dec. 5.9	58.294	40.85	36.35	22.33	17.222	42.26	45.875	48.90
15.9	58.555	42.68	36.93	19.07	17.481	39.27	46.142	45.74
25.8	58.846	44.60	37.62	16.21	17.777	36.45	46.450	42.80
35.8	59.160	46.55	38.43	13.83	18.101	33.89	46.792	40.18
Mean Place	55.458	23.14	40.979	54.14	15.208	66.73	44.200	74.90
Sec δ , Tan δ	1.001	-0.032	4.151	+4.029	1.163	+0.594	1.281	+0.800
$D\phi$ a, D_{α} a	+0.06	0.00	0.00	+0.22	+0.05	+0.03	+0.05	+0.04
$D\phi$ δ , D_{δ} δ	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Centauri. Mag. 2.6		σ Boötis. Mag. 4.5		α^2 Centauri. Mag. 0.3		β Boötis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 30	° ' " -41 47	h m 14 31	° ' " +30 5	h m 14 33	° ' " -60 29	h m 14 35	° ' " +44 45
Jan. 0.8	14.096	33.90	4.237	61.38	57.69	22.64	44.916	23.09
10.8	14.514 ⁴¹⁸	34.75 ⁸⁵	4.574 ³⁸⁷	58.99 ²⁸⁰	58.27 ⁵⁸	22.93 ²⁹	45.290 ³⁷⁴	20.64 ²⁴⁵
20.8	14.939 ⁴²⁵	35.93 ¹¹⁸	4.923 ³⁴⁹	56.99 ²⁰⁰	58.86 ⁵⁹	23.70 ⁷⁷	45.681 ³⁹¹	18.67 ¹⁹⁷
30.7	15.360 ⁴²¹	37.39 ¹⁴⁶	5.273 ³⁵⁰	55.44 ¹⁵⁵	59.45 ⁵⁹	24.91 ¹²¹	46.079 ³⁹⁸	17.26 ¹⁴¹
Feb. 9.7	15.766 ⁴⁰⁶	39.10 ¹⁷¹	5.614 ³⁴¹	54.38 ¹⁰⁶	60.01 ⁵⁶	26.52 ¹⁶¹	46.469 ³⁹⁰	16.44 ⁸²
19.7	16.151 ³⁹⁸	40.99 ¹⁸⁹	5.936 ³²²	53.85 ⁵³	60.55 ⁵⁴	28.48 ¹⁹⁶	46.841 ³⁷²	16.24 ²⁰
Mar. 1.7	16.506 ³⁵⁵	43.01 ²⁰²	6.232 ²⁹⁶	53.86 ¹	61.04 ⁴⁹	30.73 ²²⁵	47.184 ³⁴³	16.64 ⁴⁰
11.6	16.828 ³²²	45.11 ²¹⁰	6.497 ²⁶⁵	54.36 ⁵⁰	61.49 ⁴⁵	33.21 ²⁴⁸	47.491 ³⁰⁷	17.62 ⁹⁸
21.6	17.113 ²⁸⁵	47.24 ²¹³	6.728 ²³¹	55.33 ⁹⁷	61.88 ³⁹	35.86 ²⁶⁵	47.757 ²⁶⁶	19.12 ¹⁵⁰
31.6	17.360 ²⁴⁷	49.35 ²¹¹	6.920 ¹⁹²	56.71 ¹³⁸	62.21 ³³	38.61 ²⁷⁵	47.976 ²¹⁹	21.04 ¹⁹²
Apr. 10.6	17.569 ²⁰⁹	51.43 ²⁰⁸	7.074 ¹⁵⁴	58.43 ¹⁷²	62.48 ²⁷	41.41 ²⁸⁰	48.148 ¹⁷²	23.32 ²²⁸
20.5	17.739 ¹⁷⁰	53.42 ¹⁹⁹	7.190 ¹¹⁶	60.39 ¹⁹⁶	62.69 ²¹	44.20 ²⁷⁹	48.271 ¹²³	25.87 ²⁵⁵
30.5	17.870 ¹³¹	55.31 ¹⁸⁹	7.269 ⁷⁹	62.54 ²¹⁵	62.84 ¹⁵	46.93 ²⁷³	48.347 ⁷⁶	28.56 ²⁶⁹
May 10.5	17.963 ⁹⁸	57.07 ¹⁷⁶	7.313 ⁴⁴	64.75 ²²¹	62.93 ⁹	49.55 ²⁶²	48.375 ²⁸	31.30 ²⁷⁴
20.4	18.017 ⁵⁴	58.66 ¹⁵⁹	7.322 ²⁴	66.96 ²²¹	62.96 ³	52.01 ²⁴⁶	48.359 ¹⁶	34.00 ²⁷⁰
30.4	18.033 ¹⁶	60.07 ¹⁴¹	7.298 ²⁴	69.09 ²¹³	62.93 ³	54.25 ²²⁴	48.302 ⁵⁷	36.55 ²⁵⁵
June 9.4	18.011 ²²	61.25 ¹¹⁸	7.245 ⁵³	71.09 ³⁰⁰	62.84 ⁹	56.22 ¹⁹⁷	48.208 ⁹⁴	38.90 ²³⁵
19.4	17.954 ⁵⁷	62.21 ⁹⁶	7.164 ⁸¹	72.88 ¹⁷⁹	62.69 ¹⁵	57.89 ¹⁶⁷	48.078 ¹³⁰	40.95 ²⁰⁶
29.3	17.864 ⁹⁰	62.91 ⁷⁰	7.067 ¹⁰⁷	74.40 ¹⁵²	62.48 ²¹	59.21 ¹³²	47.917 ¹⁶¹	42.68 ¹⁷³
July 9.3	17.741 ¹²³	63.33 ⁴³	6.929 ¹²³	75.64 ¹²⁴	62.24 ²⁴	60.15 ⁹⁴	47.731 ¹⁸⁶	44.02 ¹³⁴
19.3	17.593 ¹⁴⁸	63.45 ¹²	6.782 ¹⁴⁷	76.57 ⁹³	61.95 ²⁹	60.68 ⁸³	47.521 ²¹⁰	44.95 ⁹³
29.3	17.422 ¹⁷¹	63.27 ¹⁸	6.619 ¹⁶³	77.14 ⁵⁷	61.64 ³¹	60.77 ⁹	47.297 ²²⁴	45.44 ⁴⁹
Aug. 8.2	17.237 ¹⁸⁵	62.81 ⁴⁶	6.448 ¹⁷¹	77.34 ²⁰	61.31 ³³	60.43 ³⁴	47.062 ²³⁵	45.48 ⁴
18.2	17.046 ¹⁹¹	62.05 ⁷⁶	6.273 ¹⁷⁵	77.18 ¹⁶	60.98 ⁸³	59.66 ⁷⁷	46.824 ²³⁸	45.06 ⁴²
28.2	16.858 ¹⁸⁸	61.03 ¹⁰²	6.101 ¹⁷²	76.67 ⁵¹	60.65 ³⁸	58.47 ¹¹⁹	46.590 ²³⁴	44.20 ⁸⁶
Sept. 7.1	16.682 ¹⁷⁶	59.76 ¹²⁷	5.939 ¹⁶²	75.78 ⁸⁹	60.35 ³⁰	56.89 ¹⁸⁸	46.368 ²²²	42.88 ¹³²
17.1	16.531 ¹⁵¹	58.32 ¹⁴⁴	5.794 ¹⁴⁵	74.52 ¹²⁶	60.10 ²⁵	55.00 ¹⁸⁹	46.168 ²⁰⁰	41.15 ¹⁷³
27.1	16.415 ¹¹⁶	56.74 ¹⁸⁸	5.675 ¹¹⁹	72.91 ¹⁶¹	59.89 ²¹	52.84 ²¹⁶	45.998 ¹⁷⁰	39.03 ²¹²
Oct. 7.1	16.842 ⁷³	55.08 ¹⁶⁶	5.589 ⁸⁶	70.98 ¹⁹³	59.75 ¹⁴	50.50 ²³⁴	45.866 ¹³²	36.53 ²⁵⁰
17.0	16.323 ¹⁹	53.46 ¹⁶²	5.544 ⁴⁵	68.74 ²²⁴	59.70 ⁵	48.07 ²⁴³	45.783 ⁸³	33.73 ²⁸⁰
27.0	16.365 ⁴²	51.90 ¹⁵⁶	5.545 ¹	66.22 ²⁵²	59.73 ³	45.65 ²⁴²	45.752 ³¹	30.64 ³⁰⁹
Nov. 6.0	16.469 ¹⁰⁴	50.50 ¹⁴⁰	5.597 ⁵²	63.49 ²⁷³	59.85 ¹²	43.33 ²³²	45.781 ²⁹	27.35 ³²⁹
16.0	16.638 ¹⁶⁹	49.35 ¹¹⁵	5.703 ¹⁰⁶	60.59 ²⁹⁰	60.08 ²⁸	41.23 ²¹⁰	45.873 ⁹²	23.93 ³⁴²
25.9	16.871 ²⁸³	48.47 ⁸⁸	5.863 ¹⁰⁶	57.58 ³⁰¹	60.40 ³²	39.43 ¹⁸⁰	46.027 ¹⁵⁴	20.45 ³⁴⁸
Dec. 5.9	17.160 ²⁸⁹	47.95 ⁵²	6.073 ²¹⁰	54.55 ³⁰³	60.79 ³⁹	37.99 ¹⁴⁴	46.241 ²¹⁴	17.02 ³⁴³
15.9	17.499 ³³⁹	47.80 ¹⁵	6.328 ²⁵⁵	51.58 ²⁹⁷	61.25 ⁴⁶	36.99 ¹⁰⁰	46.511 ²⁷⁰	13.73 ³²⁹
25.8	17.875 ³⁷⁶	48.03 ²³	6.622 ²⁹⁴	48.77 ²⁸¹	61.77 ⁵²	36.46 ⁵³	46.828 ³¹⁷	10.70 ³⁰⁸
35.8	18.280 ⁴⁰⁵	48.63 ⁶⁰	6.944 ³²²	46.20 ²⁵⁷	62.33 ⁵⁶	36.42 ⁴	47.184 ³⁵⁶	8.00 ²⁷⁰
Mean Place	13.824	37.92	4.036	78.60	57.052	36.71	44.969	43.53
Sec δ , Tan δ	1.341	-0.894	1.156	+0.580	2.030	-1.767	1.408	+0.992
$D\alpha$, D_α	+0.08	-0.05	+0.05	+0.03	+0.09	-0.09	+0.04	+0.05
$D\delta$, D_δ	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Apodis. Mag. 3.8		μ Virginis. Mag. 4.0		ϵ Boötis. Mag. 2.7		109 Virginis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 37 s	° ' " -78 41 "	h m 14 38 s	° ' " - 5 17 "	h m 14 41 s	° ' " +27 24 "	h m 14 42 s	° ' " + 2 14 "
Jan. 0.8	27.24	27.21	41.395	59.48	21.891	68.35	3.397	22.19
10.8	28.55 ¹⁸¹	26.81 ⁴⁰	41.717 ³²²	61.83 ¹⁸⁵	22.218 ³²⁷	65.93 ²⁴²	3.713 ³¹⁶	20.18 ²⁰¹
20.8	29.91 ¹³⁶	26.98 ¹⁷	42.047 ³⁸⁰	63.15 ¹⁸²	22.558 ³⁴⁰	63.87 ²⁰⁶	4.038 ³²⁵	18.27 ¹⁹¹
30.8	31.28 ¹³⁷	27.71 ⁷³	42.375 ³²⁸	64.87 ¹⁷²	22.901 ³⁴³	62.23 ¹⁶⁴	4.362 ³²⁴	16.55 ¹⁷³
Feb. 9.7	32.62 ¹³⁴	28.96 ¹²⁵	42.694 ³¹⁹	66.43 ¹⁵⁶	23.236 ³³⁵	61.06 ¹¹⁷	4.678 ³¹⁶	15.06 ¹⁴⁹
19.7	33.90 ¹²⁸	30.69 ¹⁷³	42.995 ³⁰¹	67.79 ¹³⁶	23.556 ³²⁰	60.40 ⁶⁶	4.976 ²⁹⁶	13.86 ¹²⁹
Mar. 1.7	35.11 ¹²¹	32.86 ²¹⁷	43.275 ²⁸⁰	68.91 ¹¹²	23.852 ²⁹⁶	60.26 ¹⁴	5.254 ²⁷⁸	12.96 ⁹⁰
11.6	36.20 ¹⁰⁹	35.39 ²⁵³	43.528 ²⁵³	69.79 ⁸⁸	24.119 ²⁶⁷	60.62 ³⁶	5.506 ²⁵²	12.39 ⁵⁷
21.6	37.18 ⁹⁸	38.22 ²⁸³	43.753 ²²⁵	70.39 ⁶⁰	24.354 ²³⁵	61.44 ⁸²	5.729 ²²³	12.13 ²⁶
31.6	38.02 ⁸⁴	41.29 ³⁰⁷	43.948 ¹⁹⁵	70.76 ³⁷	24.553 ¹⁹⁹	62.68 ¹²⁴	5.924 ¹⁹⁵	12.16 ³
Apr. 10.6	38.71 ⁶⁹	44.52 ³²³	44.113 ¹⁶⁵	70.88 ¹²	24.716 ¹⁶³	64.26 ¹⁵⁸	6.067 ¹⁶³	12.47 ³¹
20.5	39.25 ⁵⁴	47.85 ³³⁸	44.249 ¹³⁶	70.80 ⁸	24.842 ¹²⁶	66.10 ¹⁸⁴	6.222 ¹³⁵	12.99 ⁵³
30.5	39.63 ³⁸	51.21 ³³⁶	44.355 ¹⁰⁶	70.55 ²⁵	24.934 ⁹²	68.13 ²⁰³	6.327 ¹⁰⁵	13.71 ⁷²
May 10.5	39.83 ²⁰	54.52 ³³¹	44.433 ⁷⁸	70.16 ³⁹	24.990 ⁵⁶	70.26 ²¹²	6.403 ⁷⁶	14.55 ⁸⁴
20.4	39.88 ⁵	57.72 ³²⁰	44.484 ⁵¹	69.67 ⁴⁹	25.012 ²²	72.41 ²¹⁵	6.451 ⁴⁸	15.48 ⁹³
30.4	39.76 ¹²	60.72 ³⁰⁰	44.506 ²²	69.09 ⁵⁸	25.002 ¹⁰	74.50 ²⁰⁹	6.471 ²⁰	16.46 ⁹⁶
June 9.4	39.46 ³⁰	63.48 ²⁷⁶	44.503 ³	68.47 ⁶²	24.968 ³⁹	76.47 ¹⁹⁷	6.465 ⁶	17.46 ¹⁰⁹
19.4	39.03 ⁴³	65.91 ²⁴³	44.472 ³¹	67.82 ⁶⁵	24.895 ⁶⁸	78.27 ¹⁸⁰	6.432 ³³	18.43 ⁹⁷
29.3	38.46 ⁵⁷	67.96 ²⁰⁵	44.418 ⁵⁴	67.17 ⁶⁵	24.801 ⁹⁴	79.83 ¹⁵⁶	6.376 ⁵⁶	19.35 ⁹²
July 9.3	37.76 ⁷⁰	69.57 ¹⁶¹	44.340 ⁷⁸	66.53 ⁶⁴	24.682 ¹¹⁹	81.11 ¹²⁸	6.295 ⁸¹	20.19 ⁸⁴
19.3	36.95 ⁸¹	70.70 ¹¹³	44.243 ⁹⁷	65.91 ⁶²	24.544 ¹³⁸	82.11 ¹⁰⁰	6.196 ⁹⁹	20.94 ⁷⁵
29.3	36.08 ⁸⁷	71.32 ⁶²	44.128 ¹¹⁵	65.33 ⁵⁸	24.390 ¹⁵⁴	82.78 ⁶⁷	6.078 ¹¹⁸	21.58 ⁶⁴
Aug. 8.2	35.16 ⁹²	71.40 ⁸	44.001 ¹²⁷	64.80 ⁵³	24.223 ¹⁶⁷	83.10 ³²	5.949 ¹²⁹	22.10 ⁵³
18.2	34.23 ⁹³	70.92 ⁴⁸	43.867 ¹³⁴	64.34 ⁴⁶	24.052 ¹⁷¹	83.06 ³	5.812 ¹³⁷	22.48 ³⁸
28.2	33.33 ⁹⁰	69.92 ¹⁰⁰	43.732 ¹²⁵	63.96 ³⁸	23.881 ¹⁷¹	82.70 ³⁸	5.674 ¹³⁸	22.70 ²³
Sept. 7.1	32.49 ⁸⁴	68.41 ¹⁵¹	43.604 ¹²⁸	63.68 ²⁸	23.718 ¹⁶³	81.96 ⁷⁴	5.543 ¹³¹	22.76 ⁶
17.1	31.76 ⁷³	66.43 ¹⁹⁸	43.492 ¹¹²	63.52 ¹⁶	23.570 ¹⁴⁸	80.87 ¹⁰⁹	5.426 ¹¹⁷	22.64 ¹²
27.1	31.15 ⁶¹	64.08 ²³⁵	43.401 ⁹¹	63.51 ¹	23.447 ¹²³	79.44 ¹⁴³	5.330 ⁹⁶	22.31 ³³
Oct. 7.1	30.71 ⁴⁴	61.38 ²⁷⁰	43.341 ⁶⁰	63.68 ¹⁷	23.354 ⁹⁸	77.67 ¹⁷⁷	5.264 ⁹⁶	21.77 ⁵⁴
17.0	30.48 ²³	58.49 ²⁸⁹	43.320 ²¹	64.03 ³⁵	23.301 ⁵³	75.59 ²⁰⁸	5.236 ²⁸	21.00 ⁷⁷
27.0	30.45 ³	55.50 ²⁹⁹	43.342 ²²	64.59 ⁵⁶	23.293 ⁸	73.24 ²³⁵	5.250 ¹⁴	20.01 ⁹⁹
Nov. 6.0	30.64 ¹⁹	52.52 ²⁹⁸	43.411 ⁶⁹	65.40 ⁸¹	23.335 ⁴²	70.65 ²⁵⁹	5.311 ⁶¹	18.76 ¹²⁵
16.0	31.06 ⁴²	49.68 ²⁸⁴	43.530 ¹¹⁹	66.43 ¹⁰³	23.431 ⁹⁶	67.88 ²⁷⁷	5.422 ¹¹¹	17.30 ¹⁴⁶
25.9	31.70 ⁶⁴	47.09 ²⁵⁹	43.698 ¹⁶⁸	67.69 ¹²⁶	23.579 ¹⁴⁸	64.98 ²⁹⁰	5.581 ¹⁵⁹	15.62 ¹⁶⁸
Dec. 5.9	32.55 ⁸⁵	44.84 ²²⁵	43.912 ²¹⁴	69.15 ¹⁴⁶	23.777 ¹⁹⁸	62.03 ²⁰⁵	5.785 ²⁰⁴	13.78 ¹⁸⁴
15.9	33.56 ¹⁰¹	43.03 ¹⁸¹	44.166 ²⁵⁴	70.79 ¹⁶⁴	24.021 ²⁴⁴	59.11 ²⁶²	6.030 ²⁴⁵	11.82 ¹⁹⁶
25.8	34.72 ¹¹⁶	41.72 ¹³¹	44.452 ²⁸⁶	72.54 ¹⁷⁵	24.302 ²⁸¹	56.31 ²⁸⁰	6.308 ²⁷⁸	9.79 ²⁰⁸
35.8	35.98 ¹²⁶	40.96 ⁷⁶	44.762 ³¹⁰	74.37 ¹⁸³	24.615 ³¹³	53.74 ²⁵⁷	6.611 ³⁰³	7.75 ²⁰⁴
Mean Place	28.968	37.47	41.050	52.80	21.734	84.57	3.086	31.17
Sec δ , Tan δ	5.102	-5.002	1.004	-0.093	1.127	+0.519	1.001	+0.039
D ϕ α , D ϕ α	+0.14	-0.26	+0.06	0.00	+0.05	+0.03	+0.06	0.00
D ϕ δ , D ϕ δ	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6	-0.3	-0.6

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	8 Libræ. Mag. 5.3		α Libræ. Mag. 2.9		Groombridge 2164. Mag. 5.7		β Ursæ Minoris. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 46	° ' " -15 39	h m 14 46	° ' " -15 41	h m 14 49	° ' " +59 37	h m 14 50	° ' " +74 29
Jan. 0.8	5.873	13.55	17.320	54.70	19.213	28.90	53.71	17.20
10.8	6.204 ³³¹	15.08 ¹⁵³	17.651 ³³¹	56.23 ¹⁵³	19.670 ⁴⁵⁷	26.40 ²⁶⁰	54.46 ⁸²	14.88 ²³²
20.8	6.545 ³⁴¹	16.68 ¹⁶⁰	17.992 ³⁴¹	57.83 ¹⁶⁰	20.161 ⁴⁹¹	24.45 ¹⁹⁵	55.28 ⁸⁵	13.13 ¹⁷⁵
30.8	6.886 ³⁴¹	18.90 ¹⁶²	18.332 ³⁴⁰	59.45 ¹⁶²	20.668 ⁵⁰⁷	23.13 ¹³²	56.14 ⁸⁶	12.02 ¹¹¹
Feb. 9.7	7.217 ³³¹	19.88 ¹⁵⁸	18.663 ³³¹	61.03 ¹⁵⁸	21.176 ⁵⁰⁸	22.45 ⁶⁸	57.02 ⁸⁸	11.60 ⁴²
19.7	7.532 ³¹⁵	21.37 ¹⁴⁹	18.978 ³¹⁵	62.52 ¹⁴⁹	21.666 ⁴⁹⁰	22.45 ⁰	57.87 ⁸⁵	11.86 ²⁶
Mar. 1.7	7.824 ²⁹²	22.73 ¹³⁶	19.270 ²⁹²	63.88 ¹³⁶	22.125 ⁴⁵⁹	23.10 ⁶⁵	58.67 ⁸⁰	12.79 ⁹⁸
11.6	8.091 ²⁶⁷	23.93 ¹²⁰	19.537 ²⁶⁷	65.08 ¹²⁰	22.540 ⁴¹⁵	24.37 ¹²⁷	59.40 ⁷³	14.33 ¹⁵⁴
21.6	8.331 ²⁴⁰	24.96 ¹⁰⁸	19.777 ²⁴⁰	66.11 ¹⁰⁸	22.900 ³⁶⁰	26.20 ¹⁸³	60.02 ⁶²	16.41 ²⁰⁸
31.6	8.541 ²¹⁰	25.81 ⁸⁵	19.987 ²¹⁰	66.96 ⁸⁵	23.196 ²⁹⁸	28.50 ²³⁰	60.53 ⁵¹	18.94 ²⁵³
Apr. 10.6	8.722 ¹⁸¹	26.48 ⁶⁷	20.169 ¹⁸²	67.62 ⁶⁶	23.427 ²²⁹	31.17 ²⁶⁷	60.90 ³⁷	21.81 ²⁸⁷
20.5	8.872 ¹⁵⁰	26.98 ⁵⁰	20.319 ¹⁵⁰	68.12 ⁵⁰	23.586 ¹⁵⁹	34.09 ²⁹²	61.13 ²³	24.92 ³¹¹
30.5	8.993 ¹²¹	27.32 ³⁴	20.441 ¹²²	68.47 ³⁵	23.674 ⁸⁸	37.17 ³⁰⁸	61.23 ¹⁰	28.13 ³²¹
May 10.5	9.085 ⁹²	27.51 ¹⁹	20.533 ⁹²	68.67 ²⁰	23.692 ¹⁸	40.29 ³¹²	61.17 ⁶	31.35 ³²²
20.5	9.147 ⁶³	27.59 ⁸	20.596 ⁶³	68.75 ⁸	23.643 ⁴⁹	43.32 ³⁰⁸	60.99 ¹⁸	34.44 ³⁰⁹
30.4	9.180 ³²	27.57 ²	20.629 ³³	68.73 ²	23.531 ¹¹²	46.19 ²⁶⁷	60.68 ³¹	37.33 ²⁸⁹
June 9.4	9.186 ⁶	27.45 ¹²	20.635 ⁶	68.61 ¹²	23.360 ¹⁷¹	48.79 ²⁶⁰	60.25 ⁴³	39.92 ²⁵⁹
19.4	9.162 ²⁴	27.23 ²²	20.612 ²³	68.40 ²¹	23.136 ²²⁴	51.09 ²⁸⁰	59.72 ⁵³	42.14 ²²²
29.3	9.113 ⁴⁹	26.95 ²⁶	20.563 ⁴⁹	68.12 ²⁸	22.867 ²⁶⁹	52.99 ¹⁹⁰	59.09 ⁶³	43.93 ¹⁷⁹
July 9.3	9.038 ⁷⁵	26.59 ³⁶	20.488 ⁷⁵	67.77 ³⁵	22.558 ³⁰⁹	54.44 ¹⁴⁵	58.41 ⁶⁸	45.24 ¹³¹
19.3	8.941 ⁹⁷	26.18 ⁴¹	20.390 ⁹⁸	67.36 ⁴¹	22.218 ³⁴⁰	55.42 ⁹⁸	57.87 ⁷⁴	46.05 ⁸¹
29.3	8.824 ¹¹⁷	25.71 ⁴⁷	20.273 ¹¹⁷	66.89 ⁴⁷	21.855 ³⁶⁸	55.91 ⁴⁹	56.89 ⁷⁸	46.34 ²⁹
Aug. 8.2	8.693 ¹³¹	25.19 ⁵²	20.142 ¹³¹	66.37 ⁵²	21.478 ³⁷⁷	55.88 ³	56.09 ⁸⁰	46.09 ²⁶
18.2	8.554 ¹³⁹	24.64 ⁵⁵	20.002 ¹⁴⁰	65.81 ⁵⁶	21.097 ³⁸¹	55.35 ⁵⁸	55.29 ⁸⁰	45.30 ⁷⁹
28.2	8.412 ¹⁴²	24.07 ⁵⁷	19.860 ¹⁴²	65.24 ⁵⁷	20.721 ³⁷⁶	54.31 ¹⁰⁴	54.50 ⁷⁹	44.01 ¹²⁹
Sept. 7.2	8.277 ¹³⁵	23.50 ⁵⁷	19.724 ¹³⁶	64.67 ⁵⁷	20.363 ³⁵⁸	52.79 ¹⁸²	53.75 ⁷⁵	42.23 ¹⁷⁸
17.1	8.157 ¹²⁰	22.96 ⁵⁴	19.604 ¹²⁰	64.12 ⁵⁵	20.032 ³³¹	50.80 ¹⁹⁹	53.06 ⁶⁹	39.98 ²²⁵
27.1	8.058 ⁹⁹	22.48 ⁴⁸	19.505 ⁹⁹	63.64 ⁴⁸	19.741 ²⁹¹	48.38 ²⁴²	52.46 ⁶⁰	37.32 ²⁶⁶
Oct. 7.1	7.992 ⁶⁶	22.11 ³⁷	19.439 ⁶⁶	63.26 ³⁸	19.500 ²⁴¹	45.59 ²⁷⁹	51.93 ⁵³	34.29 ³⁰³
17.0	7.966 ²⁶	21.87 ²⁴	19.412 ²⁶	63.01 ¹⁸	19.321 ¹⁷⁹	42.46 ³¹³	51.52 ⁴¹	30.96 ³³³
27.0	7.984 ¹⁸	21.80 ⁷	19.412 ¹⁸	63.01 ⁶	19.321 ¹¹⁰	42.46 ³⁴⁰	51.52 ²⁹	30.96 ³⁵⁸
Nov. 6.0	7.984 ⁶⁷	21.80 ¹⁴	19.430 ⁶⁸	62.95 ¹⁴	19.211 ⁸⁰	39.06 ³⁶¹	51.23 ¹⁵	27.38 ³⁷⁴
16.0	8.051 ¹¹⁹	21.94 ³⁶	19.498 ¹¹⁹	63.09 ³⁵	19.181 ⁵³	35.45 ³⁷²	51.08 ⁰	23.64 ³⁸¹
25.9	8.170 ¹⁷⁰	22.30 ⁶¹	19.617 ¹⁷⁰	63.44 ⁶¹	19.234 ¹³⁷	31.73 ⁸⁷⁵	51.08 ¹⁵	19.83 ³⁷⁸
Dec. 5.9	8.340 ²¹⁸	22.91 ⁸⁵	19.787 ²¹⁸	64.05 ⁸⁵	19.371 ²²⁰	27.98 ³⁶⁷	51.23 ³¹	16.05 ³⁶⁷
15.9	8.558 ²⁶⁰	23.76 ¹⁰⁸	20.005 ²⁶⁰	64.90 ¹⁰⁸	19.591 ²⁹⁸	24.31 ³⁴⁷	51.54 ⁴⁴	12.38 ³⁴²
25.9	8.818 ²⁹⁴	24.84 ¹²⁷	20.265 ²⁹⁴	65.98 ¹²⁷	19.889 ³⁶⁷	20.84 ⁸¹⁷	51.98 ⁵⁷	8.96 ³⁰⁶
35.8	9.112 ³¹⁸	26.11 ¹⁴⁴	20.559 ³¹⁸	67.25 ¹⁴³	20.256 ⁴²⁷	17.67 ²⁷⁸	52.55 ⁶⁹	5.88 ²⁶³
Mean Place	5.561	10.04	17.008	51.20	19.924	51.22	56.060	40.81
Sec δ , Tan δ	1.039	-0.280	1.039	-0.281	1.978	+1.706	3.740	+3.603
$D\psi\alpha$, $D\omega\alpha$	+0.07	-0.01	+0.07	-0.01	+0.03	+0.08	0.00	+0.18
$D\psi\delta$, $D\omega\delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^3 Libræ. Mag. 5.6		Piazzi 221. Mag. 5.8		β Lupi. Mag. 2.8		δ Libræ. Var. 4.8-6.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 52	° ' " -11 4	h m 14 52	° ' " +14 46	h m 14 53	° ' " -42 47	h m 14 56	° ' " - 8 11
	s	"	s	"	s	"	s	"
Jan. 0.8	15.964	36.40	18.289	39.34	5.324	58.27	32.355	30.86
10.8	16.287 ³²³	38.03 ¹⁶³	18.800 ³¹¹	37.06 ²²⁸	5.739 ⁴¹⁵	58.84 ⁵⁷	32.672 ³¹⁷	32.56 ¹⁷⁰
20.8	16.620 ³³³	39.69 ¹⁶⁶	18.924 ³²⁴	35.03 ²⁰³	6.167 ⁴²⁸	59.73 ⁸⁹	33.001 ³²⁹	34.24 ¹⁶⁸
30.8	16.954 ³³⁴	41.31 ¹⁶²	19.250 ³²⁶	33.30 ¹⁷³	6.596 ⁴²⁹	60.92 ¹¹⁹	33.332 ³³¹	35.88 ¹⁶⁴
Feb. 9.7	17.280 ³²⁶	42.85 ¹⁵⁴	19.570 ³²⁰	31.91 ¹³⁹	7.016 ⁴²⁰	62.36 ¹⁴⁴	33.655 ³²³	37.40 ¹⁵²
19.7	17.591 ³¹¹	44.25 ¹⁴⁰	19.875 ³⁰⁵	30.94 ⁹⁷	7.417 ⁴⁰¹	64.01 ¹⁶⁵	33.963 ³⁰⁸	38.75 ¹³⁵
Mar. 1.7	17.882 ²⁹¹	45.47 ¹²²	20.161 ²⁸⁶	30.40 ⁵⁴	7.794 ³⁷⁷	65.81 ¹⁸⁰	34.253 ²⁹⁰	39.88 ¹¹³
11.7	18.147 ²⁶⁵	46.50 ¹⁰³	20.421 ²⁸⁰	30.27 ¹³	8.141 ³⁴⁷	67.71 ¹⁹⁰	34.518 ²⁶⁵	40.80 ⁹²
21.6	18.387 ²⁴⁰	47.32 ⁸²	20.654 ²³³	30.55 ²⁸	8.455 ³¹⁴	69.68 ¹⁹⁷	34.759 ²⁴¹	41.48 ⁶⁸
31.6	18.598 ²¹¹	47.91 ⁵⁹	20.856 ²⁰²	31.20 ⁶⁵	8.734 ²⁷⁹	71.67 ¹⁹⁹	34.971 ²¹²	41.93 ⁴⁵
	182	40	170	96	240	198	183	22
Apr. 10.6	18.780	48.31	21.026	32.16	8.974	73.65	35.154	42.15
20.5	18.932 ¹⁵²	48.52 ²¹	21.167 ¹⁴¹	33.39 ¹²³	9.177 ²⁰³	75.58 ¹⁹³	35.308 ¹⁵⁴	42.19 ⁴
30.5	19.056 ¹²⁴	48.57 ⁵	21.275 ¹⁰⁸	34.81 ¹²⁴	9.341 ¹⁶⁴	77.44 ¹⁸⁶	35.433 ¹²⁵	42.06 ¹³
May 10.5	19.151 ⁹⁵	48.48 ⁹	21.352 ⁷⁷	36.36 ¹⁵⁵	9.466 ¹²⁵	79.20 ¹⁷⁶	35.530 ⁹⁷	41.78 ²⁸
20.5	19.217 ⁶⁶	48.27 ²¹	21.400 ⁴⁸	37.98 ¹⁶²	9.550 ⁸⁴	80.83 ¹⁶³	35.598 ⁶⁸	41.40 ³⁸
	38	29	17	168	45	148	41	46
30.4	19.255	47.98	21.417	39.61	9.595	82.31	35.639	40.94
June 9.4	19.263 ⁸	47.61 ³⁷	21.406 ¹¹	41.18 ¹⁵⁷	9.599 ⁴	83.61 ¹³⁰	35.650 ¹¹	40.42 ⁵²
19.4	19.244 ¹⁹	47.19 ⁴²	21.368 ³⁸	42.65 ¹⁴⁷	9.563 ³⁶	84.70 ¹⁰⁹	35.633 ¹⁷	39.86 ⁵⁶
29.4	19.199 ⁴⁵	46.73 ⁴⁶	21.303 ⁶⁵	43.99 ¹²⁴	9.489 ⁷⁴	85.56 ⁸⁶	35.590 ⁴³	39.28 ⁵⁸
July 9.3	19.128 ⁷¹	46.23 ⁵⁰	21.214 ⁸⁹	45.15 ¹¹⁶	9.380 ¹⁰⁹	86.14 ⁵⁸	35.520 ⁷⁰	38.70 ⁵⁸
	93	51	111	96	141	31	92	58
19.3	19.035	45.72	21.103	46.11	9.239	86.45	35.428	38.12
29.3	18.921 ¹¹⁴	45.20 ⁵²	20.975 ¹²⁸	46.85 ⁷⁴	9.071 ¹⁶⁸	86.48 ³	35.315 ¹¹³	37.57 ⁵⁵
Aug. 8.2	18.793 ¹²⁸	44.68 ⁵²	20.834 ¹⁴¹	47.35 ⁵⁰	8.884 ¹⁸⁷	86.21 ²⁷	35.188 ¹²⁷	37.04 ⁵³
18.2	18.656 ¹³⁷	44.16 ⁵²	20.684 ¹⁵⁰	47.59 ²⁴	8.686 ¹⁹⁸	85.64 ⁵⁷	35.051 ¹³⁷	36.55 ⁴⁹
28.2	18.516 ¹⁴⁰	43.68 ⁴⁸	20.532 ¹⁵²	47.58 ¹	8.485 ²⁰¹	84.79 ⁸⁵	34.910 ¹⁴¹	36.12 ⁴³
	136	44	147	29	193	111	136	36
Sept. 7.2	18.380	43.24	20.385	47.29	8.292	83.68	34.774	35.76
17.1	18.258 ¹²²	42.87 ³⁷	20.250 ¹³⁵	46.71 ⁵⁸	8.119 ¹⁷³	82.36 ¹²³	34.650 ¹²⁴	35.50 ²⁶
27.1	18.156 ⁷⁰	42.60 ²⁷	20.138 ¹¹²	45.88 ⁸³	7.976 ¹⁴³	80.88 ¹⁴⁸	34.545 ¹⁰⁵	35.35 ¹⁵
Oct. 7.1	18.086 ¹⁰²	42.45 ¹⁵	20.054 ⁸⁴	44.74 ¹¹⁴	7.877 ⁹⁹	79.28 ¹⁶⁰	34.471 ⁷⁴	35.34 ¹
17.1	18.053 ³³	42.46 ¹	20.005 ⁴⁹	43.34 ¹⁴⁰	7.890 ⁴⁷	77.64 ¹⁶⁴	34.434 ³⁷	35.52 ¹⁸
	11	20	5	168	11	160	5	35
27.0	18.064	42.66	20.000	41.66	7.841	76.04	34.439	35.87
Nov. 6.0	18.123 ⁵⁹	43.06 ⁴⁰	20.042 ⁴²	39.74 ¹⁹²	7.916 ⁷⁵	74.56 ¹⁴⁸	34.492 ⁵³	36.44 ⁵⁷
16.0	18.232 ¹⁰⁹	43.69 ⁶³	20.133 ⁹¹	37.59 ²¹⁵	8.059 ¹⁴³	73.26 ¹³⁰	34.595 ¹⁰³	37.24 ⁸⁰
25.9	18.392 ¹⁶⁰	44.55 ⁸⁶	20.276 ¹⁴³	35.28 ²³¹	8.267 ²⁰⁸	72.22 ¹⁰⁴	34.748 ¹⁵³	38.26 ¹⁰²
Dec. 5.9	18.600 ²⁰⁸	45.64 ¹⁰⁹	20.464 ¹⁸⁸	32.85 ²⁴³	8.535 ²⁶⁸	71.48 ⁷⁴	34.948 ²⁰⁰	39.49 ¹²³
	249	128	233	249	322	40	243	141
15.9	18.849	46.92	20.697	30.36	8.857	71.08	35.191	40.90
25.9	19.131 ²⁸²	48.36 ¹⁴⁴	20.966 ²⁶⁹	27.89 ²⁴⁷	9.222 ³⁶⁵	71.04 ⁴	35.468 ²⁷⁷	42.46 ¹⁵⁶
35.8	19.440 ³⁰⁹	49.94 ¹⁵⁸	21.262 ²⁹⁶	25.53 ²³⁶	9.620 ³⁹⁸	71.36 ³²	35.771 ³⁰³	44.12 ¹⁶⁶
Mean Place	15.680	31.52	18.093	51.83	5.179	62.05	32.093	25.13
Sec δ , Tan δ	1.019	-0.196	1.034	+0.264	1.363	-0.926	1.010	-0.144
$D\phi a$, $D_{\omega} a$	+0.07	-0.01	+0.06	+0.01	+0.08	-0.04	+0.06	-0.01
$D\phi \delta$, $D_{\omega} \delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Boötis. Mag. 3.6		γ Scorpii. Mag. 3.4		ψ Boötis. Mag. 4.7		ϵ Boötis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 58	° ' " +40 42	h m 14 59	° ' " -24 57	h m 15 0	° ' " +27 15	h m 15 3	° ' " +25 11
	s "	"	s "	"	s "	"	s "	"
Jan. 0.8	49.013	43.79	12.748	24.11	53.365	58.68	39.364	15.17
10.8	49.358 ³⁴⁵	41.18 ²⁶¹	13.094 ³⁴⁶	25.26 ¹¹⁵	53.681 ³¹⁶	56.19 ²⁴⁹	39.676 ³¹²	12.70 ²⁴⁷
20.8	49.723 ³⁶⁵	39.01 ²¹⁷	13.451 ³⁵⁷	26.56 ¹³⁰	54.013 ³³²	54.03 ²¹⁶	40.005 ³²⁹	10.54 ²¹⁶
30.8	50.098 ³⁷⁵	37.35 ¹⁶⁶	13.809 ³⁵⁸	27.98 ¹⁴²	54.351 ³³⁸	52.29 ¹⁷⁴	40.341 ³³⁶	8.77 ¹⁷⁷
Feb. 9.7	50.471 ³⁷³	36.26 ¹⁰⁹	14.160 ³⁵¹	29.46 ¹⁴⁸	54.687 ³³⁶	51.01 ¹²⁸	40.673 ³³²	7.45 ¹³²
	361	49	337	150	324	77	321	83
19.7	50.832	35.77	14.497	30.96	55.011	50.24	40.994	6.62
Mar. 1.7	51.171 ³³⁹	35.88 ¹¹	14.814 ³¹⁷	32.44 ¹⁴⁸	55.314 ³⁰³	49.99 ²⁵	41.296 ³⁰²	6.30 ³²
11.7	51.480 ³⁰⁹	36.56 ⁶⁸	15.105 ²⁹¹	33.85 ¹⁴¹	55.593 ²⁷⁹	50.26 ²⁷	41.574 ²⁷⁸	6.48 ¹⁸
21.6	51.754 ²⁷⁴	37.78 ¹²²	15.369 ²⁶⁴	35.17 ¹³²	55.841 ²⁴⁸	51.00 ⁷⁴	41.823 ²⁴⁹	7.14 ⁶⁶
31.6	51.990 ²³⁶	39.48 ¹⁷⁰	15.606 ²³⁷	36.38 ¹²¹	56.057 ¹¹⁸	52.18 ¹¹⁵	42.040 ²¹⁷	8.22 ¹⁰⁸
	192	209	205	110	183	155	185	143
Apr. 10.6	52.182	41.57	15.811	37.48	56.240	53.73	42.225	9.65
20.5	52.332 ¹⁵⁰	43.94 ²³⁷	15.986 ¹⁷⁵	38.44 ⁹⁶	56.386 ¹⁴⁶	55.56 ¹⁸³	42.375 ¹⁵⁰	11.39 ¹⁷⁴
30.5	52.438 ¹⁰⁶	46.52 ²⁵⁸	16.130 ¹⁴⁴	39.30 ⁸⁶	56.497 ¹¹¹	57.61 ²⁰⁵	42.490 ¹¹⁵	13.34 ¹⁹⁵
May 10.5	52.501 ⁶³	49.20 ²⁶³	16.243 ¹¹³	40.02 ⁷²	56.574 ⁷²	59.78 ²¹⁷	42.571 ⁸¹	15.43 ²⁰⁹
20.5	52.521 ²⁰	51.88 ²⁶⁸	16.324 ⁸¹	40.63 ⁶¹	56.617 ⁴³	61.99 ²²¹	42.620 ⁴⁹	17.56 ²¹³
	19	269	51	48	9	218	15	209
30.4	52.502	54.47	16.375	41.11	56.626	64.17	42.635	19.65
June 9.4	52.444 ⁵⁸	56.91 ²⁴⁴	16.392 ¹⁷	41.48 ³⁷	56.602 ²⁴	66.24 ²⁰⁷	42.618 ¹⁷	21.67 ²⁰²
19.4	52.350 ⁹⁴	59.10 ²¹⁹	16.378 ¹⁴	41.71 ²³	56.548 ⁵⁴	68.16 ¹⁹²	42.571 ⁴⁷	23.55 ¹⁸⁸
29.4	52.223 ¹²⁷	61.01 ¹⁹¹	16.334 ⁴⁴	41.83 ¹²	56.465 ⁸³	69.85 ¹⁶⁹	42.495 ⁷⁶	25.21 ¹⁶⁶
July 9.3	52.066 ¹⁵⁷	62.57 ¹⁵⁶	16.260 ⁷⁴	41.82 ¹	56.355 ¹¹⁰	71.29 ¹⁴⁴	42.393 ¹⁰²	26.63 ¹⁴²
	181	118	100	15	133	114	127	114
19.3	51.885	63.75	16.160	41.67	56.222	72.43	42.266	27.77
29.3	51.683 ²⁰²	64.52 ⁷⁷	16.036 ¹²⁴	41.37 ³⁰	56.069 ¹⁵³	73.25 ⁸²	42.120 ¹⁴⁶	28.60 ⁸³
Aug. 8.2	51.465 ²¹⁸	64.86 ³⁴	15.896 ¹⁴⁰	40.95 ⁴²	55.901 ¹⁶⁸	73.74 ⁴⁹	41.958 ¹⁶²	29.12 ⁵²
18.2	51.239 ²²⁶	64.77 ⁹	15.745 ¹⁵¹	40.40 ⁵⁵	55.724 ¹⁷⁷	73.87 ¹³	41.787 ¹⁷¹	29.29 ¹⁷
28.2	51.013 ²²⁶	64.24 ⁵³	15.589 ¹⁵⁶	39.75 ⁶⁵	55.545 ¹⁷⁰	73.63 ²⁴	41.613 ¹⁷⁴	29.11 ¹⁸
	219	97	152	75	175	59	171	51
Sept. 7.2	50.794	63.27	15.437	39.00	55.370	73.04	41.442	28.60
17.1	50.591 ²⁰³	61.89 ¹³⁸	15.299 ¹³⁸	38.19 ⁸¹	55.208 ¹⁶²	72.09 ⁹⁶	41.285 ¹⁵⁷	27.72 ⁸⁸
27.1	50.413 ¹⁷⁸	60.09 ¹⁸⁰	15.186 ¹¹³	37.36 ⁸³	55.067 ¹⁴¹	70.78 ¹³¹	41.147 ¹³⁸	26.50 ¹²²
Oct. 7.1	50.268 ¹⁴⁵	57.91 ²¹⁸	15.104 ⁸²	36.55 ⁸¹	54.956 ¹¹¹	69.13 ¹⁶⁵	41.038 ¹⁰⁹	24.94 ¹⁵⁶
17.1	50.166 ¹⁰²	55.38 ²⁵³	15.064 ⁴⁰	35.82 ⁷⁸	54.883 ⁷³	67.15 ¹⁹⁸	40.966 ⁷²	23.08 ¹⁸⁶
	52	283	7	63	29	226	29	217
27.0	50.114	52.55	15.071	35.19	54.854	64.89	40.937	20.91
Nov. 6.0	50.118 ⁴	49.47 ³⁰⁸	15.130 ⁵⁹	34.73 ⁴⁶	54.874 ²⁰	62.37 ²⁵²	40.957 ²⁰	18.50 ²⁴¹
16.0	50.180 ⁶²	46.22 ³²⁵	15.244 ¹¹⁴	34.48 ²⁵	54.946 ⁷²	59.64 ²⁷³	41.029 ⁷²	15.86 ²⁶⁴
25.9	50.303 ¹²³	42.86 ³³⁶	15.413 ¹⁶⁹	34.47 ¹	55.072 ¹²⁶	56.76 ²⁸⁸	41.153 ¹²⁴	13.07 ²⁷⁹
Dec. 5.9	50.485 ¹⁸²	39.48 ³³⁸	15.633 ²²⁰	34.72 ²⁵	55.250 ¹⁷⁸	53.82 ²⁹⁴	41.328 ¹⁷⁵	10.20 ²⁸⁷
	237	330	265	51	225	294	223	287
15.9	50.722	36.18	15.898	35.23	55.475	50.88	41.551	7.33
25.9	51.006 ²⁸⁴	33.08 ³¹⁰	16.200 ³⁰²	36.00 ⁷⁷	55.741 ²⁶⁶	48.03 ²⁸⁵	41.814 ²⁶³	4.54 ²⁷⁹
35.8	51.329 ³²³	30.26 ²⁸²	16.530 ³³⁰	36.99 ⁹⁹	56.039 ²⁹⁸	45.39 ²⁶⁴	42.109 ²⁹⁵	1.93 ²⁶¹
Mean Place	49.182	62.45	12.512	23.19	53.334	74.23	39.326	30.10
Sec δ , Tan δ	1.319	+0.860	1.103	-0.465	1.125	+0.515	1.105	+0.470
$D\psi\alpha$, $D_\omega\alpha$	+0.05	+0.04	+0.07	-0.02	+0.05	+0.02	+0.05	+0.02
$D\psi\delta$, $D_\omega\delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Lupi. Mag. 3.5		ι Libræ. Mag. 4.7		3 Serpentis. Mag. 5.4		γ Triang. Aust. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 6	° ' " -51 46	h m 15 7	° ' " -19 28	h m 15 11	° ' " + 5 14	h m 15 11	° ' " -68 22
Jan. 0.9	18.760	57.26	29.405	45.09	3.861	38.97	7.62	19.24
10.8	19.229 ⁴⁶⁹	57.34 ⁸	29.735 ³³⁰	46.35 ¹²⁶	4.163 ³⁰²	36.93 ³⁰⁴	8.34 ⁷²	18.67 ⁵⁷
20.8	19.718 ⁴⁸⁹	57.82 ⁴⁸	30.077 ³⁴²	47.73 ¹³⁸	4.479 ³¹⁶	35.01 ¹⁹²	9.09 ⁷⁸	18.59 ⁴²
30.8	20.213 ⁴⁹⁵	58.87 ⁸⁵	30.422 ³⁴⁵	49.17 ¹⁴⁴	4.799 ³²⁰	33.30 ¹⁷¹	9.87 ⁷⁵	19.01 ⁸⁶
Feb. 9.7	20.701 ⁴⁸⁸	59.86 ¹¹⁹	30.763 ³⁴¹	50.63 ¹⁴⁶	5.116 ³¹⁷	31.84 ¹⁴⁶	10.64 ⁷⁷	19.89 ¹³¹
19.7	21.173 ⁴⁷²	61.34 ¹⁴⁸	31.091 ³²⁸	52.03 ¹⁴⁰	5.422 ³⁰⁶	30.70 ¹¹⁴	11.39 ⁷⁵	21.20 ¹⁷⁰
Mar. 1.7	21.620 ⁴⁴⁷	63.07 ¹⁷³	31.399 ³⁰⁸	53.35 ¹³²	5.712 ²⁹⁰	29.89 ⁸¹	12.10 ⁷¹	22.90 ²⁰⁴
11.7	22.037 ⁴¹⁷	64.99 ¹⁹²	31.686 ²⁸⁷	54.56 ¹²¹	5.980 ²⁶⁸	29.42 ⁴⁷	12.77 ⁶⁷	24.94 ²³¹
21.6	22.417 ³⁹⁰	67.07 ²⁰⁸	31.947 ²⁶¹	55.63 ¹⁰⁷	6.223 ²⁴³	29.30 ¹²	13.39 ⁶²	27.25 ²⁵⁶
31.6	22.757 ³⁴⁰	69.25 ²¹⁸	32.181 ²³⁴	56.56 ⁹³	6.439 ²¹⁶	29.51 ²¹	13.94 ⁵⁵	29.81 ²⁷¹
Apr. 10.6	23.056 ²⁹⁹	71.49 ²²⁴	32.385 ²⁰⁴	57.34 ⁷⁸	6.629 ¹⁹⁰	30.00 ⁴⁹	14.42 ⁴⁸	32.52 ²⁸²
20.6	23.309 ²⁵³	73.76 ²³⁷	32.561 ¹⁷⁶	57.97 ⁶³	6.788 ¹⁵⁹	30.75 ⁷⁵	14.83 ⁴¹	35.34 ²⁸⁹
30.5	23.517 ²⁰⁸	76.00 ²²⁴	32.708 ¹⁴⁷	58.47 ⁵⁰	6.920 ¹³²	31.69 ⁹⁴	15.16 ³³	38.23 ²⁹⁰
May 10.5	23.677 ¹⁶⁰	78.19 ²¹⁹	32.825 ¹¹⁷	58.85 ³⁸	7.021 ¹⁰¹	32.77 ¹⁰⁸	15.39 ²³	41.12 ²⁸⁰
20.5	23.788 ¹¹¹	80.27 ²⁰⁸	32.912 ⁸⁷	59.10 ²⁵	7.092 ⁷¹	33.96 ¹¹⁹	15.54 ¹⁵	43.94 ²⁸²
30.4	23.849 ⁶¹	82.22 ¹⁹⁵	32.966 ⁵⁴	59.26 ¹⁶	7.137 ⁴⁵	35.19 ¹³³	15.60 ⁶	46.64 ²⁷⁰
June 9.4	23.860 ¹¹	83.99 ¹⁷⁷	32.991 ²⁵	59.33 ⁷	7.150 ¹³	36.41 ¹²²	15.58 ²	49.15 ²⁵¹
19.4	23.821 ³⁹	85.53 ¹⁵⁴	32.986 ⁵	59.30 ³	7.135 ¹⁵	37.58 ¹¹⁷	15.47 ¹¹	51.42 ²²⁷
29.4	23.734 ⁸⁷	86.82 ¹²⁹	32.950 ³⁶	59.19 ¹¹	7.093 ⁴²	38.70 ¹¹²	15.26 ²¹	53.39 ¹⁹⁷
July 9.3	23.602 ¹³²	87.83 ¹⁰¹	32.883 ⁶⁷	59.00 ¹⁹	7.024 ⁶⁹	39.71 ¹⁰¹	14.99 ²⁷	55.00 ¹⁶¹
19.3	23.430 ¹⁷²	88.51 ⁶⁸	32.792 ⁹¹	58.72 ²⁸	6.931 ⁹³	40.59 ⁸⁸	14.65 ³⁴	56.22 ¹²³
29.3	23.223 ²⁰⁷	88.84 ³³	32.677 ¹¹⁵	58.36 ³⁶	6.817 ¹¹⁴	41.33 ⁷⁴	14.26 ³⁹	56.99 ⁷⁷
Aug. 8.3	22.991 ²³²	88.82 ²	32.545 ¹³²	57.93 ⁴³	6.686 ¹³¹	41.92 ⁵⁹	13.82 ⁴⁴	57.30 ³¹
18.2	22.743 ²⁴⁸	88.42 ⁴⁰	32.400 ¹⁴⁵	57.43 ⁵⁰	6.544 ¹⁴²	42.34 ⁴²	13.36 ⁴⁶	57.12 ¹⁸
28.2	22.490 ²⁵³	87.66 ⁷⁶	32.249 ¹⁵¹	56.86 ⁵⁷	6.396 ¹⁴⁸	42.56 ²²	12.89 ⁴⁷	56.46 ⁶⁶
Sept. 7.2	22.244 ²⁴⁶	86.56 ¹¹⁰	32.102 ¹⁴⁷	56.26 ⁶⁰	6.250 ¹⁴⁶	42.60 ⁴	12.44 ⁴⁵	55.33 ¹¹³
17.1	22.021 ²²³	85.16 ¹⁴⁰	31.965 ¹³⁷	55.65 ⁶¹	6.113 ¹³⁷	42.41 ¹⁹	12.02 ⁴²	53.78 ¹⁵⁷
27.1	21.831 ¹⁹⁰	83.49 ¹⁶⁷	31.850 ¹¹⁵	55.06 ⁶⁰	5.996 ¹¹⁷	42.02 ³⁹	11.67 ³⁵	51.80 ¹⁹⁶
Oct. 7.1	21.690 ¹⁴¹	81.64 ¹⁸⁵	31.765 ⁸⁵	54.52 ⁵³	5.904 ⁹²	41.39 ⁶³	11.39 ²⁸	49.54 ²²⁸
17.1	21.607 ⁸⁸	79.66 ¹⁹⁸	31.716 ⁴⁹	54.07 ⁴⁵	5.847 ⁵⁷	40.54 ⁸⁵	11.20 ¹⁹	47.03 ²⁵¹
27.0	21.593 ¹⁴	77.65 ²⁰¹	31.714 ²	53.77 ³⁰	5.831 ¹⁶	39.43 ¹¹¹	11.14 ⁶	44.39 ²⁶⁴
Nov. 6.0	21.655 ⁶²	75.69 ¹⁹⁶	31.763 ⁴⁹	53.62 ¹⁵	5.861 ³⁰	38.10 ¹³³	11.19 ⁵	41.72 ²⁶⁷
16.0	21.794 ¹³⁹	73.87 ¹⁸²	31.864 ¹⁰¹	53.68 ⁶	5.940 ⁷⁹	36.53 ¹⁷⁶	11.36 ¹⁷	39.14 ²⁵⁸
26.0	22.009 ²¹⁵	72.27 ¹⁶⁰	32.017 ¹⁵³	53.98 ³⁰	6.069 ¹²⁹	34.77 ¹⁵⁷	11.67 ³¹	36.72 ²⁴²
Dec. 5.9	22.298 ²⁸⁹	70.96 ¹³¹	32.221 ²⁰⁴	54.51 ⁵³	6.246 ¹⁷⁷	32.84 ¹⁹³	12.09 ⁴²	34.59 ²¹³
15.9	22.650 ³⁵²	69.98 ⁹⁸	32.469 ²⁴⁸	55.27 ⁷⁶	6.466 ²²⁰	30.81 ²⁰³	12.61 ⁵²	32.81 ¹⁷⁸
25.9	23.056 ⁴⁰⁶	69.40 ⁵⁸	32.754 ²⁸⁵	56.25 ⁹⁸	6.723 ²⁵⁷	28.72 ²⁰⁹	13.22 ⁶¹	31.45 ¹³⁶
35.8	23.503 ⁴⁴⁷	69.21 ¹⁹	33.068 ³¹⁴	57.42 ¹¹⁷	7.009 ²⁸⁶	26.64 ²⁰⁸	13.90 ⁶⁸	30.56 ⁸⁹
Mean Place	18.818	62.64	29.193	42.58	3.707	48.40	8.361	27.17
Sec δ, Tan δ	1.617	-1.270	1.061	-0.354	1.004	+0.092	2.714	-2.522
Dψ α, Dω α	+0.08	-0.06	+0.07	-0.02	+0.06	0.00	+0.11	-0.11
Dψ δ, Dω δ	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7	-0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Boötis. Mag. 3.5		β Libræ. Mag. 2.7		γ Ursæ Minoris. Mag. 3.1		μ Boötis pr. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 12	° ' +33 36	h m 15 12	° ' - 9 4	h m 15 20	° ' +72 7	h m 15 21	° ' +37 39
	s	"	s	"	s	"	s	"
Jan. 0.9	9.271	69.02	32.483	44.12	48.51	23.92	21.019	46.52
10.8	9.590	66.39	32.795	45.73	49.12	21.26	21.339	43.82
20.8	9.929	64.14	33.120	47.34	49.80	19.13	21.684	41.50
30.8	10.279	62.35	33.449	48.91	50.54	17.62	22.041	39.66
Feb. 9.7	10.629	61.07	33.774	50.37	51.31	16.77	22.401	38.36
19.7	10.969	60.34	34.088	51.67	52.07	16.60	22.753	37.63
Mar. 1.7	11.292	60.17	34.384	52.77	52.81	17.12	23.090	37.49
11.7	11.589	60.56	34.659	53.66	53.49	18.28	23.402	37.95
21.6	11.857	61.48	34.910	54.32	54.10	20.03	23.686	38.94
31.6	12.092	62.86	35.136	54.76	54.62	22.30	23.935	40.43
Apr. 10.6	12.290	64.64	35.334	54.98	55.03	24.98	24.147	42.33
20.6	12.451	66.74	35.504	55.02	55.33	27.98	24.320	44.57
30.5	12.574	69.05	35.646	54.90	55.51	31.16	24.452	47.04
May 10.5	12.658	71.50	35.759	54.63	55.56	34.42	24.545	49.67
20.5	12.706	73.99	35.843	54.26	55.50	37.65	24.596	52.33
30.4	12.715	76.44	35.899	53.82	55.32	40.74	24.608	54.95
June 9.4	12.689	78.78	35.924	53.32	55.04	43.61	24.580	57.46
19.4	12.629	80.93	35.920	52.78	54.65	46.16	24.515	59.78
29.4	12.537	82.84	35.886	52.23	54.18	48.33	24.416	61.83
July 9.3	12.414	84.45	35.825	51.67	53.62	50.07	24.284	63.58
19.3	12.267	85.72	35.739	51.11	53.01	51.34	24.123	64.99
29.3	12.096	86.65	35.630	50.57	52.35	52.09	23.939	66.00
Aug. 8.3	11.909	87.19	35.503	50.06	51.66	52.33	23.736	66.61
18.2	11.711	87.33	35.364	49.58	50.95	52.04	23.519	66.79
28.2	11.509	87.07	35.218	49.14	50.24	51.23	23.297	66.55
Sept. 7.2	11.310	86.40	35.074	48.77	49.55	49.90	23.077	65.88
17.1	11.122	85.33	34.940	48.48	48.90	48.06	22.870	64.78
27.1	10.957	83.87	34.826	48.31	48.30	45.81	22.682	63.28
Oct. 7.1	10.821	82.05	34.738	48.25	47.78	43.13	22.524	61.39
17.1	10.723	79.87	34.686	48.35	47.34	40.06	22.405	59.12
27.0	10.670	77.37	34.677	48.65	47.00	36.73	22.332	56.53
Nov. 6.0	10.670	74.62	34.715	49.13	46.78	33.14	22.311	53.67
16.0	10.723	71.64	34.803	49.83	46.69	29.41	22.347	50.58
26.0	10.833	68.53	34.941	50.75	46.74	25.63	22.443	47.35
Dec. 5.9	10.998	65.36	35.128	51.88	46.91	21.89	22.596	44.06
15.9	11.214	62.21	35.359	53.18	47.22	18.31	22.804	40.79
25.9	11.476	59.20	35.626	54.64	47.67	14.99	23.060	37.66
35.8	11.775	56.40	35.922	56.19	48.21	12.07	23.357	34.78
Mean Place	9.406	85.59	32.293	38.73	51.060	45.49	21.295	63.51
Sec δ , Tan δ	1.201	+0.665	1.013	-0.160	3.258	+3.101	1.263	+0.772
$D\phi a$, $D\alpha a$	+0.06	+0.03	+0.06	-0.01	0.00	+0.13	+0.05	+0.03
$D\phi \delta$, $D\alpha \delta$	-0.3	-0.7	-0.3	-0.7	-0.3	-0.8	-0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Serpentis. Mag. 5.5		ϵ Draconis. Mag. 3.5		β Libræ. Mag. 5.9		β Coronæ Borealis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 21	° ' " +15 42	h m 15 23	° ' " +59 14	h m 15 23	° ' " -16 25	h m 15 24	° ' " +29 23
	s	"	s	"	s	"	s	"
Jan. 0.9	56.353	56.83	3.881	62.67	34.500	44.08	24.276	12.98
10.8	56.647 ²⁹⁴	54.50 ²³³	4.295 ⁴¹⁴	59.88 ²⁷⁹	34.817 ³¹⁷	45.36 ¹²⁸	24.580 ³⁰⁴	10.37 ²⁶¹
20.8	56.961 ³¹⁴	52.41 ²⁰⁹	4.753 ⁴⁵⁸	57.59 ²²⁹	35.149 ³³²	46.72 ¹³⁶	24.905 ³²⁵	8.10 ²²⁷
30.8	57.282 ³²¹	50.61 ¹⁸⁰	5.239 ⁴⁸⁶	55.88 ¹⁷¹	35.487 ³³⁸	48.11 ¹³⁹	25.241 ³³⁶	6.24 ¹⁸⁶
Feb. 9.8	57.602 ³²⁰	49.16 ¹⁴⁵	5.737 ⁴⁹⁸	54.80 ¹⁰⁸	35.823 ³³⁶	49.48 ¹³⁷	25.579 ³³⁸	4.85 ¹³⁹
19.7	57.914 ³¹²	48.12 ¹⁰⁴	6.229 ⁴⁹²	54.40 ⁴⁰	36.149 ³²⁶	50.78 ¹³⁰	25.910 ³³¹	3.98 ⁸⁷
Mar. 1.7	58.211 ²⁹⁷	47.53 ⁵⁹	6.704 ⁴⁷⁵	54.67 ²⁷	36.458 ³⁰⁹	51.95 ¹¹⁷	26.226 ³¹⁶	3.65 ³³
11.7	58.487 ²⁷⁶	47.36 ¹⁷	7.146 ⁴⁴²	55.60 ⁹³	36.749 ²⁹¹	52.99 ¹⁰⁴	26.520 ²⁹⁴	3.86 ²¹
21.6	58.739 ²⁵²	47.62 ²⁶	7.543 ³⁹⁷	57.12 ¹⁵²	37.016 ²⁶⁷	53.88 ⁸⁹	26.788 ²⁶⁸	4.58 ⁷²
31.6	58.965 ²²⁶	48.28 ⁶⁶	7.886 ³⁴³	59.17 ²⁰⁶	37.259 ²⁴³	54.59 ⁷¹	27.026 ²³⁸	5.77 ¹¹⁹
Apr. 10.6	59.161 ¹⁹⁶	49.27 ⁹⁹	8.168 ²⁸²	61.66 ²⁴⁹	37.474 ²¹⁵	55.15 ⁵⁶	27.231 ²⁰⁶	7.36 ¹⁵⁹
20.6	59.328 ¹⁶⁷	50.56 ¹²⁹	8.386 ²¹⁸	64.47 ²⁸¹	37.663 ¹⁸⁹	55.55 ⁴⁰	27.402 ¹⁷¹	9.26 ¹⁹⁰
30.5	59.465 ¹³⁷	52.08 ¹⁵²	8.534 ¹⁴⁸	67.52 ³⁰⁵	37.822 ¹⁵⁹	55.81 ²⁴	27.539 ¹³⁷	11.42 ²¹⁶
May 10.5	59.570 ¹⁰⁵	53.75 ¹⁶⁷	8.614 ⁸⁰	70.68 ³¹⁶	37.952 ¹³⁰	55.95 ¹⁶	27.639 ¹⁰⁰	13.73 ²³¹
20.5	59.644 ⁷⁴	55.51 ¹⁷⁶	8.625 ¹¹	73.85 ³¹⁷	38.063 ¹⁰¹	55.99 ⁴	27.703 ⁶⁴	16.10 ²³⁷
30.5	59.689 ⁴⁵	57.29 ¹⁷⁸	8.569 ⁵⁶	76.91 ³⁰⁸	38.122 ⁹⁹	55.94 ⁵	27.731 ²⁸	18.47 ²³⁷
June 9.4	59.700 ¹¹	59.03 ¹⁷⁴	8.451 ¹¹⁸	79.79 ²⁸⁸	38.161 ³⁹	55.82 ¹²	27.725 ⁶	20.75 ²²⁸
19.4	59.682 ¹⁸	60.67 ¹⁶⁴	8.273 ¹⁷⁸	82.39 ²⁶⁰	38.168 ⁷	55.64 ¹⁸	27.685 ⁴⁰	22.86 ²¹¹
29.4	59.635 ⁴⁷	62.18 ¹⁵¹	8.042 ²³¹	84.65 ²²⁶	38.144 ²⁴	55.39 ²⁸	27.612 ⁷³	24.78 ¹⁹²
July 9.3	59.557 ⁷⁸	63.51 ¹³³	7.764 ²⁷⁸	86.50 ¹⁸⁵	38.090 ⁵⁴	55.10 ²⁹	27.509 ¹⁰³	26.43 ¹⁶⁵
19.3	59.457 ¹⁰⁰	64.64 ¹¹³	7.445 ³¹⁹	87.94 ¹⁴⁴	38.007 ⁸³	54.76 ³⁴	27.378 ¹³¹	27.78 ¹³⁵
29.3	59.333 ¹²⁴	65.55 ⁹¹	7.092 ³⁵⁸	88.87 ⁹³	37.899 ¹⁰⁶	54.37 ³⁹	27.224 ¹⁵⁴	28.80 ¹⁰²
Aug. 8.3	59.191 ¹⁴²	66.20 ⁶⁵	6.717 ³⁷⁵	89.31 ⁴⁴	37.772 ¹²⁷	53.95 ⁴²	27.050 ¹⁷⁴	29.47 ⁶⁷
18.2	59.035 ¹⁵⁶	66.59 ³⁹	6.328 ³⁸⁹	89.24 ⁷	37.629 ¹⁴³	53.49 ⁴⁶	26.864 ¹⁸⁶	29.77 ³⁰
28.2	58.874 ¹⁶¹	66.70 ¹¹	5.934 ³⁹⁴	88.66 ⁵⁸	37.478 ¹⁵¹	53.01 ⁴⁸	26.670 ¹⁹⁴	29.69 ⁸
Sept. 7.2	58.712 ¹⁶²	66.52 ¹⁸	5.547 ³⁸⁷	87.57 ¹⁰⁹	37.327 ¹⁵¹	52.52 ⁴⁹	26.478 ¹⁹²	29.24 ⁴⁵
17.2	58.559 ¹⁵³	66.06 ⁴⁶	5.180 ³⁶⁷	86.00 ¹⁶⁷	37.185 ¹⁴²	52.04 ⁴⁸	26.296 ¹⁸²	28.40 ⁸⁴
27.1	58.422 ¹³⁷	65.30 ⁷⁶	4.845 ³³⁵	83.96 ²⁰⁴	37.061 ¹²⁴	51.59 ⁴⁵	26.132 ¹⁶⁴	27.18 ¹²³
Oct. 7.1	58.312 ¹¹⁰	64.25 ¹⁰⁵	4.552 ²⁹³	81.50 ²⁴⁶	36.964 ⁹⁷	51.21 ³⁸	25.994 ¹³⁸	25.59 ¹⁵⁹
17.1	58.236 ⁷⁶	62.91 ¹³⁴	4.316 ²³⁶	78.66 ²⁸⁴	36.903 ⁶¹	50.94 ²⁷	25.893 ¹⁰¹	23.67 ¹⁹²
27.0	58.200 ³⁶	61.28 ¹⁶³	4.146 ¹⁷⁰	75.47 ³¹⁹	36.885 ¹⁸	50.79 ¹⁵	25.835 ⁵⁸	21.42 ²²⁵
Nov. 6.0	58.210 ¹⁰	59.41 ¹⁸⁷	4.049 ⁹⁷	72.02 ³⁴⁵	36.915 ³⁰	50.81 ²	25.825 ¹⁰	18.90 ²⁵²
16.0	58.270 ⁶⁰	57.29 ²¹²	4.034 ¹⁵	68.40 ³⁶²	36.997 ⁸²	51.03 ²²	25.868 ⁴³	16.15 ²⁷⁵
26.0	58.381 ¹¹¹	55.00 ²²⁹	4.102 ⁶⁸	64.68 ³⁷²	37.131 ¹³⁴	51.45 ⁴²	25.967 ⁹⁹	13.23 ²⁹²
Dec. 5.9	58.541 ¹⁶⁰	52.56 ²⁴⁴	4.256 ¹⁵⁴	60.96 ³⁷²	37.316 ¹⁸⁵	52.09 ⁶⁴	26.118 ¹⁵¹	10.22 ³⁰¹
15.9	58.747 ²⁰⁶	50.07 ²⁴⁹	4.493 ²³⁷	57.36 ³⁶⁰	37.546 ²³⁰	52.95 ⁸⁶	26.320 ²⁰²	7.20 ³⁰²
25.9	58.993 ²⁴⁶	47.58 ²⁴⁹	4.804 ³¹¹	53.98 ³³⁸	37.815 ²⁹⁹	53.99 ¹⁰⁴	26.566 ²⁴⁶	4.27 ²⁹³
35.9	59.270 ²⁷⁷	45.17 ²⁴¹	5.181 ³⁷⁷	60.95 ³⁰³	38.113 ²⁹⁸	55.18 ¹¹⁹	26.848 ²⁸²	1.51 ²⁷⁶
Mean Place	56.323	68.76	4.993	82.97	34.354	40.70	24.423	28.09
Sec δ , Tan δ	1.039	+0.281	1.956	+1.681	1.043	-0.295	1.148	+0.563
$D\phi\alpha$, $D_\omega\alpha$	+0.06	+0.01	+0.03	+0.07	+0.07	-0.01	+0.05	+0.02
$D\phi\delta$, $D_\omega\delta$	-0.3	-0.8	-0.3	-0.8	-0.3	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^1 Boötis. Mag. 5.2		γ Lupi (mean). Mag. 3.0		γ Libræ. Mag. 4.0		α Coronæ Borealis. Mag. 2.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 27 s	° ' " +41 6 "	h m 15 29 s	° ' " -40 53 "	h m 15 30 s	° ' " -14 30 "	h m 15 31 s	° ' " +26 59 "
Jan. 0.9	56.477	38.05	36.230	17.53	52.973	52.20	10.242	21.63
10.8	56.800 ³²³	35.26 ²⁷⁹	36.615 ³⁸⁵	17.78 ²⁵	53.284 ⁸¹¹	53.51 ¹³¹	10.539 ²⁹⁷	18.94 ²⁵⁹
20.8	57.151 ³⁵¹	32.89 ²³⁷	37.022 ⁴⁰⁷	18.32 ⁵⁴	53.609 ³²⁵	54.89 ¹³⁸	10.857 ³¹⁸	16.66 ²²⁸
30.8	57.517 ³⁶⁸	31.02 ¹⁸⁷	37.437 ⁴¹⁵	19.13 ⁸¹	53.942 ³³³	56.27 ¹³⁸	11.188 ³³¹	14.75 ¹⁹¹
Feb. 9.8	57.889 ³⁷²	29.69 ¹³³	37.851 ⁴¹⁴	20.17 ¹⁰⁴	54.275 ³³³	57.61 ¹³⁴	11.521 ³³³	13.31 ¹⁴⁴
19.7	58.255 ³⁶⁶	28.95 ⁷⁴	38.255 ⁴⁰⁴	21.41 ¹²⁴	54.599 ³²⁴	58.86 ¹²⁶	11.848 ³²⁷	12.38 ⁹³
Mar. 1.7	58.605 ³⁵⁰	28.83 ¹²	38.643 ³⁸⁸	22.79 ¹³⁸	54.907 ³⁰⁸	59.96 ¹¹⁰	12.162 ³¹⁴	11.96 ⁴²
11.7	58.934 ³²⁹	29.32 ⁴⁹	39.006 ³⁶⁶	24.28 ¹⁴⁹	55.199 ²⁹²	60.92 ⁹⁶	12.455 ²⁹⁸	12.07 ¹¹
21.7	59.232 ²⁹⁸	30.36 ¹⁰⁴	39.347 ³³⁸	25.84 ¹⁵⁶	55.469 ²⁷⁰	61.70 ⁷⁸	12.724 ²⁶⁹	12.68 ⁶¹
31.6	59.496 ²⁶⁴	31.92 ¹⁵⁶	39.656 ³⁰⁹	27.45 ¹⁶¹	55.713 ²⁴⁴	62.30 ⁶⁰	12.965 ²⁴¹	13.75 ¹⁰⁷
Apr. 10.6	59.721 ²²⁵	33.92 ²⁰⁰	39.934 ²⁷⁸	29.08 ¹⁶³	55.932 ²¹⁹	62.73 ⁴³	13.175 ²¹⁰	15.22 ¹⁴⁷
20.6	59.906 ¹⁸⁵	36.25 ²³³	40.177 ²⁴³	30.70 ¹⁶²	56.126 ¹⁹⁴	62.99 ²⁶	13.353 ¹⁷⁸	17.02 ¹⁸⁰
30.5	60.047 ¹⁴¹	38.84 ²⁵⁹	40.385 ²⁰⁸	32.28 ¹⁵⁸	56.290 ¹⁶⁴	63.11 ¹²	13.497 ¹⁴⁴	19.07 ²⁰⁵
May 10.5	60.145 ⁹⁸	41.58 ²⁷⁴	40.555 ¹⁷⁰	33.81 ¹⁵³	56.427 ¹³⁷	63.12 ¹	13.606 ¹⁰⁹	21.28 ²²¹
20.5	60.200 ⁵⁵	44.37 ²⁷⁶	40.686 ¹⁸¹	35.27 ¹⁴⁶	56.533 ¹⁰⁶	63.08 ⁹	13.680 ⁷⁴	23.57 ²²⁹
30.5	60.212 ¹²	47.13 ²⁷⁶	40.777 ⁹¹	36.63 ¹³⁶	56.609 ⁷⁶	62.84 ¹⁹	13.719 ³⁹	25.87 ²³⁰
June 9.4	60.183 ⁷⁰	49.76 ²⁶³	40.826 ⁴⁹	37.87 ¹²⁴	56.654 ⁴⁵	62.60 ²⁴	13.724 ⁵	28.10 ²²³
19.4	60.113 ²⁹	52.19 ²⁴³	40.862 ⁶	38.95 ¹⁰⁸	56.666 ¹²	62.32 ²⁸	13.695 ²⁹	30.18 ²⁰⁸
29.4	60.006 ¹⁰⁷	54.35 ²¹⁶	40.897 ³⁵	39.86 ⁹¹	56.647 ¹⁹	61.99 ³³	13.633 ⁶²	32.07 ¹⁵⁷
July 9.4	59.865 ¹⁴¹	56.21 ¹⁸⁶	40.722 ⁷⁵	40.56 ⁷⁰	56.598 ⁴⁹	61.62 ³⁷	13.641 ⁹²	33.72 ¹⁶⁵
19.3	59.692 ¹⁷³	57.69 ¹⁴⁸	40.610 ¹¹²	41.06 ⁵⁰	56.519 ⁷⁹	61.23 ³⁹	13.420 ¹²¹	35.10 ¹³⁸
29.3	59.493 ¹⁹⁹	58.77 ¹⁰⁸	40.465 ¹⁴⁵	41.31 ²⁵	56.416 ¹⁰⁸	60.82 ⁴¹	13.275 ¹⁴⁵	36.16 ¹⁰⁶
Aug. 8.3	59.274 ²¹⁹	59.42 ⁶⁵	40.292 ¹⁷³	41.29 ²	56.289 ¹²⁷	60.38 ⁴⁴	13.109 ¹⁶⁶	36.88 ⁷²
18.2	59.041 ²³³	59.64 ²²	40.101 ¹⁹¹	41.00 ²⁹	56.147 ¹⁴²	59.93 ⁴⁵	12.929 ¹⁸⁰	37.25 ³⁷
28.2	58.801 ²⁴⁰	59.41 ²³	39.899 ²⁰²	40.46 ⁵⁴	55.996 ¹⁵¹	59.48 ⁴⁵	12.742 ¹⁸⁷	37.26 ¹
Sept. 7.2	58.562 ²³⁹	58.73 ⁶⁸	39.697 ²⁰²	39.66 ⁸⁰	55.844 ¹⁵²	59.03 ⁴⁵	12.554 ¹⁸⁸	36.90 ²⁶
17.2	58.335 ²²⁷	57.61 ¹¹²	39.507 ¹⁹⁰	38.65 ¹⁰¹	55.699 ¹⁴⁵	58.61 ⁴²	12.374 ¹⁸⁰	36.17 ⁷³
27.1	58.129 ²⁰⁶	56.06 ¹⁵⁵	39.340 ¹⁶⁷	37.43 ¹²²	55.572 ¹²⁷	58.24 ³⁷	12.212 ¹⁶²	35.07 ¹¹⁰
Oct. 7.1	57.952 ¹⁷⁷	54.10 ¹⁹⁶	39.208 ¹³²	36.08 ¹³⁵	55.470 ¹⁰²	57.94 ³⁰	12.075 ¹³⁷	33.63 ¹⁴⁴
17.1	57.814 ¹³⁸	51.77 ²³³	39.122 ⁸⁶	34.64 ¹⁴⁴	55.408 ⁶⁷	57.77 ¹⁷	11.973 ¹⁰²	31.83 ¹⁸⁰
27.1	57.724 ⁹⁰	49.10 ²⁶⁷	39.090 ³²	33.19 ¹⁴⁵	55.378 ²⁵	57.73 ⁴	11.912 ⁶¹	29.72 ²¹¹
Nov. 6.0	57.688 ³⁶	46.14 ²⁹⁶	39.120 ⁸⁰	31.79 ¹⁴⁰	55.401 ⁷³	57.85 ¹²	11.899 ¹³	27.33 ²³⁹
16.0	57.710 ²²	42.96 ³¹⁸	39.214 ⁹⁴	30.52 ¹²⁷	55.475 ²⁴	58.17 ³²	11.939 ⁴⁰	24.69 ²⁶⁴
26.0	57.794 ⁸⁴	39.63 ³³³	39.372 ¹⁵⁸	29.43 ¹⁰⁹	55.601 ¹²⁶	58.69 ⁵²	12.032 ⁹³	21.89 ²⁸⁰
Dec. 5.9	57.939 ¹⁴⁵	36.24 ³³⁹	39.593 ²²¹	28.57 ⁸⁶	55.776 ¹⁷⁵	59.43 ⁷⁴	12.078 ¹⁴⁶	18.98 ²⁹¹
15.9	58.141 ²⁰²	32.88 ³³⁶	39.870 ²⁷⁷	27.99 ⁵⁸	55.998 ²²²	60.35 ⁹²	12.178 ¹⁹⁵	16.03 ²⁹⁵
25.9	58.394 ²⁵³	29.66 ³²²	40.195 ³²⁵	27.72 ²⁷	56.259 ²⁶¹	61.46 ¹¹¹	12.373 ²³⁸	16.03 ²⁸⁸
35.9	58.693 ²⁹⁹	26.70 ²⁹⁶	40.560 ³⁶⁵	27.76 ⁴	56.551 ²⁹²	62.70 ¹²⁴	12.611 ²⁷⁶	13.15 ²⁸⁸
Mean Place	56.882	55.34	36.230	20.03	52.856	48.31	10.392	35.81
Sec δ , Tan δ	1.327	+0.873	1.323	-0.866	1.033	-0.259	1.122	+0.509
$D\psi\alpha$, $D_m\alpha$	+0.04	+0.04	+0.08	-0.04	+0.07	-0.01	+0.05	+0.02
$D\psi\delta$, $D_m\delta$	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Cor. Bor. seq. Mag. 5.1		α Serpentis. Mag. 2.8		β Serpentis. Mag. 3.7		κ Serpentis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 36	° ' " +36 53	h m 15 40	° ' " + 6 40	h m 15 42	° ' " +15 40	h m 15 45	° ' " +18 23
Jan. 0.9	14.790	60.67	10.713	60.30	21.342	39.38	0.051	37.54
10.9	15.097 ³⁰⁷	57.90 ²⁷⁷	10.997 ²⁸⁴	58.24 ²⁰⁶	21.626 ²⁸⁴	37.04 ²²⁴	0.332 ²⁸¹	35.12 ²⁴²
20.8	15.429 ³³²	55.50 ²⁴⁰	11.302 ³⁰⁵	56.31 ¹⁹³	21.929 ³⁰³	34.92 ²¹²	0.636 ³⁰⁴	32.94 ²¹⁸
30.8	15.779 ³⁵⁰	53.55 ¹⁹⁵	11.616 ³¹⁴	54.60 ¹⁷¹	22.244 ³¹⁵	33.07 ¹⁸⁵	0.951 ³¹⁵	31.05 ¹⁸⁹
Feb. 9.8	16.135 ³⁵⁶	52.14 ¹⁴¹	11.932 ³¹⁶	53.14 ¹⁴⁶	22.562 ³¹⁸	31.58 ¹⁴⁹	1.271 ³²⁰	29.55 ¹⁵⁰
19.7	16.486 ³⁵¹	51.28 ⁸⁶	12.242 ³¹⁰	52.00 ¹¹⁴	22.875 ³¹³	30.49 ¹⁰⁹	1.586 ³¹⁵	28.47 ¹⁰⁸
Mar. 1.7	16.825 ³³⁹	51.01 ²⁷	12.539 ²⁹⁷	51.22 ⁷⁸	23.176 ³⁰¹	29.84 ⁶⁵	1.890 ³⁰⁴	27.84 ⁶³
11.7	17.143 ³¹⁸	51.33 ³²	12.820 ²⁸¹	50.79 ⁴³	23.462 ²⁸⁶	29.63 ²¹	2.178 ²⁸⁸	27.69 ¹⁵
21.7	17.434 ²⁹¹	52.20 ⁸⁷	13.080 ²⁶⁰	50.74 ⁵	23.726 ²⁶⁴	29.85 ²²	2.445 ²⁶⁷	27.99 ³⁰
31.6	17.695 ²⁶¹	53.58 ¹³⁸	13.318 ²³⁸	51.03 ²⁹	23.966 ²⁴⁰	30.48 ⁶³	2.689 ²⁴⁴	28.71 ⁷²
Apr. 10.6	17.921 ²²⁶	55.40 ¹⁸²	13.530 ²¹²	51.63 ⁶⁰	24.179 ²¹³	31.46 ⁹⁸	2.905 ²¹⁶	29.81 ¹¹⁰
20.6	18.110 ¹⁸⁹	57.58 ²¹⁸	13.716 ¹⁸⁶	52.49 ⁸⁶	24.365 ¹⁸⁶	32.76 ¹³⁰	3.093 ¹⁸⁸	31.22 ¹⁴¹
30.6	18.260 ¹⁵⁰	60.01 ²⁴³	13.873 ¹⁵⁷	53.56 ¹⁰⁷	24.521 ¹⁵⁶	34.29 ¹⁵³	3.250 ¹⁵⁷	32.90 ¹⁶⁸
May 10.5	18.369 ¹⁰⁹	62.63 ²⁶²	14.002 ¹²⁹	54.80 ¹²⁴	24.647 ¹²⁶	36.01 ¹⁷²	3.377 ¹²⁷	34.74 ¹⁸⁴
20.5	18.438 ⁶⁹	65.31 ²⁶⁸	14.102 ¹⁰⁰	56.14 ¹³⁴	24.742 ⁹⁵	37.82 ¹⁸¹	3.472 ¹⁸¹	36.68 ¹⁹⁴
30.5	18.467 ²⁹	67.98 ²⁶⁷	14.170 ⁶⁸	57.53 ¹³⁹	24.804 ⁶²	39.66 ¹⁸⁴	3.534 ⁶²	38.66 ¹⁹⁸
June 9.4	18.457 ¹⁰	70.55 ²⁵⁷	14.208 ²⁸	58.93 ¹⁴⁰	24.834 ³⁰	41.48 ¹⁸²	3.564 ³⁰	40.61 ¹⁹⁵
19.4	18.409 ⁴⁸	72.95 ²⁴⁰	14.215 ⁷	60.28 ¹³⁵	24.833 ¹	43.22 ¹⁷⁴	3.561 ³	42.47 ¹⁸⁶
29.4	18.324 ⁸⁵	75.11 ²¹⁶	14.191 ²⁴	61.55 ¹²⁷	24.799 ³⁴	44.83 ¹⁶¹	3.524 ³⁷	44.19 ¹⁷³
July 9.4	18.204 ¹²⁰	76.99 ¹⁸⁸	14.137 ⁵⁴	62.70 ¹¹⁵	24.735 ⁶⁴	46.28 ¹⁴⁵	3.457 ⁶⁷	45.72 ¹⁵³
19.3	18.053 ¹⁵¹	78.52 ¹⁵³	14.055 ⁸²	63.72 ¹⁰²	24.643 ⁹²	47.51 ¹²³	3.361 ⁹⁶	47.04 ¹³²
29.3	17.877 ¹⁷⁶	79.67 ¹¹⁵	13.947 ¹⁰⁸	64.58 ⁸⁶	24.524 ¹¹⁹	48.53 ¹⁰²	3.238 ¹²³	48.10 ¹⁰⁸
Aug. 8.3	17.679 ¹⁹⁸	80.43 ⁷⁶	13.819 ¹²⁸	65.26 ⁶⁸	24.385 ¹³⁹	49.29 ⁷⁶	3.094 ¹⁴⁴	48.89 ⁷⁹
18.3	17.464 ²¹⁵	80.78 ³⁵	13.674 ¹⁴⁵	65.77 ⁵¹	24.229 ¹⁵⁶	49.80 ⁵¹	2.933 ¹⁶¹	48.99 ⁵³
28.2	17.242 ²²³	80.70 ⁸	13.519 ¹⁵³	66.06 ²⁹	24.062 ¹⁶⁷	50.01 ²¹	2.762 ¹⁷¹	49.61 ²⁰
Sept. 7.2	17.019 ²²³	80.18 ⁵²	13.362 ¹⁵⁷	66.15 ⁹	23.894 ¹⁶⁸	49.95 ⁶	2.588 ¹⁷⁴	49.51 ¹⁰
17.2	16.805 ²¹⁴	79.25 ⁹⁸	13.210 ¹⁵²	66.01 ¹⁴	23.732 ¹⁶²	49.59 ³⁶	2.420 ¹⁶⁸	49.10 ⁴¹
27.1	16.609 ¹⁹⁶	77.89 ¹³⁶	13.073 ¹³⁷	65.65 ³⁶	23.585 ¹⁴⁷	48.94 ⁶⁵	2.265 ¹⁵⁵	48.36 ⁷⁴
Oct. 7.1	16.440 ¹⁶⁹	76.13 ¹⁷⁶	12.959 ¹¹⁴	65.04 ⁶¹	23.458 ¹²⁷	47.97 ⁹⁷	2.133 ¹³²	47.31 ¹⁰⁶
17.1	16.308 ¹³²	74.00 ²¹³	12.877 ⁸²	64.20 ⁸⁴	23.363 ⁹⁵	46.72 ¹²⁵	2.033 ¹⁰⁰	45.96 ¹³⁵
27.1	16.220 ⁸⁸	71.52 ²⁴⁸	12.834 ⁴³	63.10 ¹¹⁰	23.308 ⁵⁵	45.17 ¹⁵⁵	1.972 ⁶¹	44.30 ¹⁶⁶
Nov. 6.0	16.183 ³⁷	68.76 ²⁷⁶	12.835 ¹	61.77 ¹³³	23.299 ⁹	43.37 ¹⁸⁰	1.956 ¹⁶	42.38 ¹⁹²
16.0	16.201 ¹⁸	65.75 ³⁰¹	12.885 ⁵⁰	60.20 ¹⁵⁷	23.338 ³⁹	41.33 ²⁰⁴	1.990 ³⁴	40.20 ²¹⁸
26.0	16.278 ⁷⁷	62.68 ³¹⁷	12.984 ⁹⁹	58.44 ¹⁷⁶	23.428 ⁹⁰	39.09 ²²⁴	2.075 ⁸⁵	37.83 ²³⁷
Dec. 6.0	16.413 ¹³⁵	59.32 ³²⁶	13.133 ¹⁴⁹	56.51 ¹⁹³	23.568 ¹⁴⁰	36.70 ²³⁹	2.210 ¹³⁵	35.31 ²⁵³
15.9	16.604 ¹⁹¹	56.07 ³²⁵	13.327 ¹⁹⁴	54.47 ²⁰⁴	23.755 ¹⁸⁷	34.22 ²⁴⁸	2.393 ¹⁸³	32.71 ²⁶⁰
25.9	16.844 ²⁴⁰	52.92 ³¹⁵	13.560 ²³³	52.37 ²¹⁰	23.984 ²²⁹	31.74 ²⁴⁸	2.619 ²²⁶	30.13 ²⁵⁸
35.9	17.125 ²⁸¹	49.99 ²⁹³	13.826 ²⁶⁶	50.28 ²⁰⁹	24.247 ²⁶³	29.33 ²⁴¹	2.880 ²⁶¹	27.63 ²⁶⁰
Mean Place	15.152	76.73	10.702	69.49	21.414	50.67	0.164	49.35
Sec δ , Tan δ	1.250	+0.751	1.007	+0.117	1.039	+0.281	1.054	+0.333
D δ a, D δ a	+0.04	+0.03	+0.06	0.00	+0.05	+0.01	+0.05	+0.01
D δ δ , D δ δ	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Serpentis. Mag. 3.6		12 H. Draconis. Mag. 5.1		ϵ Serpentis. Mag. 3.8		ζ Ursae Minoris. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 45	° ' " 3 10	h m 15 45	° ' " +62 50	h m 15 46	° ' " + 4 43	h m 15 46	° ' " +78 2
Jan. 0.9	17.245	44.04	22.20	61.57	40.620	28.30	54.64	41.52
10.9	17.532 ²⁸⁷	45.74 ¹⁷⁰	22.61 ⁴¹	58.61 ²⁹⁶	40.902 ²⁸²	28.32 ¹⁹⁸	55.39 ⁷⁵	38.72 ²⁸⁰
20.8	17.839 ³⁰⁷	47.38 ¹⁶⁴	23.09 ⁴⁸	56.14 ²⁴⁷	41.204 ³⁰²	24.45 ¹⁸⁷	56.28 ⁸⁹	36.41 ²³¹
30.8	18.155 ³¹⁶	48.93 ¹⁵⁵	23.60 ⁵¹	54.24 ¹⁹⁰	41.516 ³¹²	22.77 ¹⁶⁸	57.28 ¹⁰⁰	34.68 ¹⁷⁸
Feb. 9.8	18.473 ³¹⁸	50.32 ¹³⁹	24.13 ⁵³	52.95 ¹²⁹	41.831 ³¹⁵	21.32 ¹⁴⁵	58.34 ¹⁰⁶	33.58 ¹¹⁰
19.7	18.786 ³¹³	51.49 ¹¹⁷	24.67 ⁵⁴	52.33 ⁶²	42.141 ³¹⁰	20.18 ¹¹⁴	59.43 ¹⁰⁹	33.16 ⁴²
Mar. 1.7	19.086 ³⁰⁰	52.40 ⁹¹	25.20 ⁵⁸	52.41 ⁸	42.440 ²⁹⁰	19.37 ⁸¹	60.50 ¹⁰⁷	33.41 ²⁵
11.7	19.372 ²⁸⁶	53.04 ⁶⁴	25.71 ⁵¹	53.14 ⁷⁸	42.724 ²⁸⁴	18.90 ⁴⁷	61.52 ¹⁰²	34.33 ⁹²
21.7	19.638 ²⁶⁶	53.42 ³⁸	26.17 ⁴⁶	54.50 ¹³⁶	42.987 ²⁶³	18.78 ¹²	62.46 ⁹⁴	35.86 ¹⁵³
31.6	19.882 ²⁴⁴	53.51 ⁹	26.58 ⁴¹	56.43 ¹⁹⁸	43.230 ²⁴³	19.00 ²²	63.28 ⁸²	37.93 ²⁰⁷
Apr. 10.6	20.102 ²²⁰	53.34 ¹⁷	26.92 ³⁴	58.83 ²⁴⁰	43.447 ²¹⁷	19.51 ⁵¹	63.96 ⁶⁸	40.46 ²⁶³
20.6	20.297 ¹⁹⁵	52.97 ³⁷	27.19 ²⁷	61.60 ²⁷⁷	43.639 ¹⁹²	20.29 ⁷⁸	64.46 ⁵⁰	43.34 ²⁸⁸
30.6	20.464 ¹⁶⁷	52.42 ⁵⁵	27.39 ²⁰	64.65 ³⁰⁵	43.803 ¹⁶⁴	21.28 ⁹⁹	64.80 ³⁴	46.46 ³¹²
May 10.5	20.605 ¹⁴¹	51.71 ⁷¹	27.51 ¹²	67.85 ³²⁰	43.940 ¹³⁷	22.43 ¹¹⁵	64.94 ¹⁴	49.71 ³²⁶
20.5	20.715 ¹¹⁰	50.91 ⁸⁰	27.55 ⁴	71.11 ³²⁶	44.046 ¹⁰⁶	23.68 ¹²⁵	64.92 ²	52.98 ³²⁷
30.5	20.796 ⁸¹	50.04 ⁸⁷	27.52 ³	74.31 ³²⁰	44.122 ⁷⁶	24.99 ¹⁸¹	64.71 ²¹	56.17 ³¹⁹
June 9.4	20.847 ⁵¹	49.15 ⁸⁹	27.41 ¹¹	77.35 ³⁰⁴	44.168 ⁴⁶	26.31 ¹³²	64.32 ³⁹	59.16 ²⁹⁹
19.4	20.865 ¹⁸	48.26 ⁸⁹	27.22 ¹⁹	80.16 ²⁸¹	44.182 ¹⁴	27.59 ¹²⁸	63.78 ⁵⁴	61.89 ²⁷⁸
29.4	20.852 ¹³	47.39 ⁸⁷	26.98 ²⁴	82.65 ²⁴⁹	44.164 ¹⁸	28.81 ¹²²	63.10 ⁶⁸	64.29 ²⁴⁰
July 9.4	20.809 ⁴⁸	46.57 ⁸²	26.68 ³⁰	84.75 ²¹⁰	44.116 ⁴⁸	29.92 ¹¹¹	62.28 ⁸²	66.28 ¹⁹⁹
19.3	20.735 ⁷⁴	45.82 ⁷⁵	26.32 ³⁶	86.42 ¹⁶⁷	44.039 ⁷⁷	30.91 ⁹⁹	61.36 ⁹²	67.82 ¹⁵⁴
29.3	20.636 ⁹⁹	45.16 ⁶⁶	25.92 ⁴⁰	87.63 ¹²¹	43.936 ¹⁰⁸	31.76 ⁸⁵	60.36 ¹⁰⁰	68.87 ¹⁰⁶
Aug. 8.3	20.513 ¹²³	44.58 ⁵⁶	25.50 ⁴²	88.34 ⁷¹	43.810 ¹²⁶	32.44 ⁶⁸	59.29 ¹⁰⁷	69.42 ⁵⁵
18.3	20.374 ¹³⁹	44.09 ⁴⁹	25.05 ⁴⁵	88.54 ²⁰	43.667 ¹⁴³	32.96 ⁵²	58.19 ¹¹⁰	69.45 ³
28.2	20.224 ¹⁵⁰	43.71 ³⁸	24.58 ⁴⁷	88.22 ⁸²	43.513 ¹⁵⁴	33.30 ²⁴	57.08 ¹¹¹	68.94 ⁵¹
Sept. 7.2	20.070 ¹⁵⁴	43.46 ²⁶	24.12 ⁴⁶	87.38 ⁸⁴	43.355 ¹⁵⁸	33.43 ¹³	55.97 ¹¹¹	67.98 ¹⁰¹
17.2	19.921 ¹⁴⁹	43.34 ¹²	23.68 ⁴⁴	86.04 ¹³⁴	43.202 ¹⁵³	33.37 ⁶	54.90 ¹⁰⁷	66.43 ¹⁵⁰
27.1	19.785 ¹²⁶	43.36 ²	23.26 ⁴²	84.21 ¹⁸⁸	43.063 ¹³⁹	33.08 ²⁹	53.90 ¹⁰⁰	64.45 ¹⁹⁸
Oct. 7.1	19.673 ¹¹²	43.55 ¹⁹	22.89 ³⁷	81.92 ²²⁹	42.946 ¹¹⁷	32.58 ⁵⁰	53.00 ⁹⁰	62.04 ²⁴¹
17.1	19.592 ⁸¹	43.92 ⁸⁷	22.57 ³²	79.22 ²⁷⁰	42.860 ⁸⁶	31.85 ⁷³	52.20 ⁸⁰	59.25 ²⁷⁹
27.1	19.551 ⁴¹	44.48 ⁵⁶	22.32 ²⁵	76.17 ³⁰⁵	42.812 ⁴⁸	30.88 ⁹⁷	51.56 ⁶⁴	56.11 ³¹⁴
Nov. 6.0	19.554 ³	45.25 ⁷⁷	22.16 ¹⁶	72.82 ³³⁵	42.809 ³	29.66 ¹²²	51.06 ⁵⁰	52.71 ³⁴⁰
16.0	19.606 ⁵¹	46.22 ⁹⁷	22.08 ⁸	69.24 ³⁵⁸	42.854 ⁴⁵	28.24 ¹⁴²	50.75 ³¹	49.10 ²⁶¹
26.0	19.707 ¹⁰²	47.40 ¹¹⁸	22.09 ¹	65.54 ³⁷⁰	42.949 ⁹⁵	26.60 ¹⁶⁴	50.63 ¹²	45.40 ³⁷⁰
Dec. 6.0	19.858 ¹⁵¹	48.76 ¹³⁶	22.19 ¹⁰	61.80 ³⁷⁴	43.093 ¹⁴⁴	24.80 ¹⁸⁰	50.71 ⁸	41.70 ³⁷⁰
15.9	20.055 ¹⁹⁷	50.27 ¹⁵¹	22.39 ²⁰	58.13 ³⁶⁷	43.281 ¹⁸⁸	22.87 ¹⁹³	50.99 ²⁸	38.12 ³⁵⁸
25.9	20.290 ²³⁵	51.90 ¹⁶³	22.68 ²⁹	54.65 ³⁴⁸	43.510 ²²⁹	20.87 ²⁰⁰	51.47 ⁴⁸	34.74 ³³⁸
35.9	20.559 ²⁶⁹	53.58 ¹⁶⁸	23.06 ³⁸	51.46 ³¹⁹	43.773 ²⁶³	18.87 ²⁰⁰	52.13 ⁶⁶	31.69 ³⁰⁵
Mean Place	17.206	37.38	23.868	80.66	40.625	36.86	59.691	61.37
Sec δ , Tan δ	1.002	-0.056	2.192	+1.950	1.003	+0.083	4.829	+4.724
D ψ α , D ω α	+0.06	0.00	+0.02	+0.07	+0.06	0.00	-0.04	+0.17
D ψ δ , D ω δ	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Triang. Aust. Mag. 3.0		λ Libræ. Mag. 5.1		γ Serpentis. Mag. 3.9		π Scorpii. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	15 47	-63 10	15 48	-19 55	15 52	+15 55	15 53	-25 52
	"	"	"	"	"	"	"	"
Jan. 0.9	48.34	27.12	30.797	14.59	36.984	43.28	49.657	35.36
10.9	48.91	26.26	31.107	15.58	37.260	40.90	49.974	36.05
20.8	49.52	25.83	31.435	16.67	37.559	38.73	50.313	36.89
30.8	50.16	25.82	31.773	17.83	37.871	36.82	50.665	37.85
Feb. 9.8	50.81	26.24	32.113	18.99	38.187	35.28	51.019	38.88
19.7	51.45	27.05	32.449	20.13	38.501	34.13	51.368	39.94
Mar. 1.7	52.08	28.23	32.773	21.20	38.805	33.42	51.707	41.00
11.7	52.68	29.72	33.080	22.17	39.095	33.15	52.030	42.04
21.7	53.24	31.51	33.369	23.02	39.365	33.32	52.333	43.01
31.6	53.76	33.53	33.634	23.74	39.611	33.91	52.615	43.91
Apr. 10.6	54.22	35.74	33.875	24.33	39.833	34.87	52.871	44.74
20.6	54.64	38.10	34.090	24.81	40.028	36.14	53.102	45.47
30.6	54.99	40.56	34.279	25.17	40.194	37.66	53.304	46.13
May 10.5	55.27	43.07	34.438	25.42	40.330	39.37	53.476	46.71
20.5	55.49	45.59	34.566	25.59	40.434	41.18	53.617	47.22
30.5	55.64	48.06	34.663	25.70	40.506	43.03	53.723	47.66
June 9.4	55.71	50.42	34.726	25.74	40.546	44.87	53.794	48.03
19.4	55.70	52.61	34.755	25.72	40.553	46.64	53.829	48.33
29.4	55.62	54.60	34.751	25.64	40.527	48.27	53.829	48.55
July 9.4	55.47	56.30	34.712	25.51	40.469	49.75	53.794	48.70
19.3	55.26	57.69	34.640	25.32	40.382	51.02	53.722	48.74
29.3	54.98	58.71	34.540	25.07	40.267	52.06	53.619	48.68
Aug. 8.3	54.66	59.33	34.415	24.76	40.130	52.85	53.489	48.51
18.3	54.30	59.51	34.271	24.40	39.975	53.38	53.338	48.22
28.2	53.93	59.26	34.114	23.98	39.807	53.61	53.172	47.83
Sept. 7.2	53.55	58.56	33.952	23.51	39.636	53.56	53.002	47.33
17.2	53.18	57.43	33.795	23.01	39.470	53.21	52.836	46.73
27.1	52.85	55.91	33.653	22.51	39.315	52.56	52.685	46.07
Oct. 7.1	52.57	54.06	33.536	22.03	39.182	51.62	52.559	45.38
17.1	52.37	51.92	33.453	21.60	39.080	50.37	52.467	44.69
27.1	52.25	49.60	33.412	21.28	39.016	48.83	52.419	44.04
Nov. 6.0	52.22	47.19	33.419	21.05	38.996	47.02	52.422	43.48
16.0	52.31	44.77	33.478	20.99	39.024	44.96	52.478	43.05
26.0	52.49	42.45	33.590	21.12	39.104	42.71	52.591	42.80
Dec. 6.0	52.78	40.32	33.754	21.46	39.234	40.30	52.757	42.73
15.9	53.15	38.46	33.967	21.98	39.412	37.80	52.974	42.89
25.9	53.61	36.94	34.222	22.71	39.632	35.29	53.235	43.24
35.9	54.15	35.81	34.510	23.59	39.888	32.83	53.533	43.79
Mean Place	49.006	32.92	30.751	12.01	37.106	54.25	49.642	34.10
Sec δ , Tan δ	2.216	-1.978	1.064	-0.362	1.040	+0.285	1.111	-0.485
$D\phi a$, $D_\omega a$	+0.10	-0.07	+0.07	-0.01	+0.05	+0.01	+0.07	-0.02
$D\phi \delta$, $D_\omega \delta$	-0.2	-0.8	-0.2	-0.8	-0.2	-0.8	-0.2	-0.9

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Coronæ Borealis. Mag. 4.2		δ Scorpil. Mag. 2.5		θ Draconis. Mag. 4.1		β Scorpil. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 54	° ' " +27 6	h m 15 55	° ' " -22 23	h m 16 0	° ' " +58 46	h m 16 0	° ' " -19 34
Jan. 0.9	8.730	49.64	25.349	13.25	18.492	54.19	36.445	47.72
10.9	9.009 279	46.99 265	25.658 309	14.08 83	18.850 358	51.14 305	36.746 301	48.65 93
20.8	9.314 305	44.62 237	25.988 330	15.02 94	19.261 411	48.52 262	37.067 321	49.67 102
30.8	9.635 321	42.62 200	26.330 342	16.08 106	19.712 451	46.44 203	37.400 333	50.75 108
Feb. 9.8	9.963 328	41.06 156	26.675 345	17.16 108	20.187 475	44.96 148	37.738 338	51.84 109
	327	106	340	107	484	83	335	106
19.8	10.290	40.00	27.015	18.23	20.671	44.13	38.073	52.90
Mar. 1.7	10.609 319	39.46 54	27.346 331	19.26 103	21.150 479	43.98 15	38.399 326	53.88 96
11.7	10.911 302	39.47 1	27.662 316	20.23 97	21.610 480	44.51 53	38.709 310	54.77 89
21.7	11.192 281	39.98 51	27.958 296	21.10 87	22.036 426	45.66 115	39.003 294	55.53 76
31.6	11.450 258	40.97 99	28.233 275	21.87 77	22.420 384	47.40 174	39.276 273	56.16 63
	230	141	251	65	331	225	250	51
Apr. 10.6	11.680	42.38	28.484	22.52	22.751	49.65	39.526	56.67
20.6	11.878 198	44.16 178	28.710 226	23.08 56	23.024 278	52.30 265	39.752 226	57.07 40
30.6	12.043 165	46.22 206	28.908 198	23.54 46	23.235 211	55.27 297	39.951 199	57.35 28
May 10.5	12.175 132	48.46 224	29.077 169	23.92 38	23.378 143	58.43 316	40.122 171	57.53 12
20.5	12.274 99	50.81 235	29.216 139	24.22 30	23.455 7	61.68 325	40.263 141	57.65 18
	62	239	106	22	79	323	106	5
30.5	12.336	53.20	29.322	24.44	23.464	64.91	40.371	57.70
June 9.5	12.361 25	55.54 234	29.393 71	24.61 17	23.405 59	68.03 312	40.446 75	57.70 0
19.4	12.361 10	57.77 223	29.429 36	24.72 11	23.283 122	70.95 292	40.486 40	57.65 5
29.4	12.306 45	59.81 204	29.430 1	24.77 5	23.101 182	73.58 263	40.491 5	57.55 10
July 9.4	12.227 79	61.63 182	29.395 35	24.75 2	22.865 236	75.87 229	40.461 30	57.42 13
	111	155	68	8	288	189	64	19
19.3	12.116	63.18	29.327	24.67	22.577	77.76	40.397	57.23
29.3	11.978 138	64.42 124	29.227 100	24.52 15	22.248 329	79.20 144	40.303 94	56.99 24
Aug. 8.3	11.815 163	65.34 92	29.102 125	24.27 25	21.884 364	80.17 97	40.181 122	56.71 28
18.3	11.635 180	65.90 56	28.956 146	23.95 32	21.496 388	80.62 45	40.038 143	56.38 33
28.2	11.443 192	66.09 19	28.794 162	23.56 39	21.093 403	80.58 4	39.880 158	56.00 38
	196	18	166	47	405	56	164	43
Sept. 7.2	11.247	65.91	28.628	23.09	20.688	80.02	39.716	55.57
17.2	11.055 192	65.35 56	28.467 161	22.56 53	20.292 396	78.95 107	39.555 161	55.12 45
27.2	10.876 179	64.43 92	28.319 149	22.00 56	19.917 375	77.39 156	39.408 147	54.65 47
Oct. 7.1	10.721 155	63.13 130	28.196 123	21.44 56	19.578 339	75.36 203	39.282 126	54.21 44
17.1	10.598 123	61.47 166	28.106 91	20.91 53	19.285 292	72.90 246	39.190 92	53.81 40
	84	199	48	47	232	234	52	32
27.1	10.514	59.48	28.057	20.44	19.053	70.06	39.138	53.49
Nov. 6.0	10.476 38	57.20 228	28.059 2	20.08 36	18.888 165	66.88 318	39.133 5	53.30 19
16.0	10.489 13	54.65 255	28.112 53	19.87 21	18.801 87	63.44 344	39.181 48	53.24 6
26.0	10.555 66	51.90 275	28.220 108	19.83 4	18.797 4	59.84 360	39.281 100	53.36 12
Dec. 6.0	10.675 120	49.02 288	28.380 160	19.99 16	18.878 81	56.15 369	39.433 152	53.67 31
	171	293	210	35	164	366	201	49
15.9	10.846	46.09	28.590	20.34	19.042	52.49	39.634	54.16
25.9	11.063 217	43.19 290	28.843 253	20.88 54	19.287 245	48.98 351	39.878 244	54.85 60
35.9	11.319 256	40.42 277	29.131 288	21.60 72	19.603 316	45.72 326	40.156 278	55.67 82
Mean Place	9.009	62.90	25.331	11.19	19.978	71.79	36.440	45.00
Sec δ , Tan δ	1.123	+0.512	1.082	-0.412	1.929	+1.650	1.061	-0.356
$D\psi\alpha$, $D_\alpha\alpha$	+0.05	+0.02	+0.07	-0.01	+0.02	+0.06	+0.07	-0.01
$D\psi\delta$, $D_\alpha\delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Herculis. Mag. 5.3		Groombridge 3390. Mag. 5.4		ϕ Herculis. Mag. 4.3		δ^1 Apodis. Mag. 4.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s	° ' " +17 15	h m s	° ' " +68 1	h m s	° ' " +45 8	h m s	° ' " -78 29
Jan. 0.9	19.448	50.62	2.89	25.14	8.463	51.56	50.83	13.98
10.9	19.716 ²⁶⁸	48.22 ²⁴⁰	3.32 ⁴³	22.07 ³⁰⁷	8.759 ²⁹⁶	48.56 ³⁰⁰	51.95 ¹¹²	12.30 ¹⁶⁸
20.8	20.007 ²⁹¹	46.03 ²¹⁹	3.84 ⁵²	19.45 ²⁶²	9.091 ³³²	45.92 ²⁶⁴	53.18 ¹²³	11.10 ¹²⁰
30.8	20.315 ³⁰⁸	44.13 ¹⁹⁰	4.41 ⁵⁷	17.38 ²⁰⁷	9.452 ³⁶¹	43.75 ²¹⁷	54.49 ¹³¹	10.38 ⁷²
Feb. 9.8	20.628 ³¹³	42.58 ¹⁵⁵	5.03 ⁶²	15.93 ¹⁴⁵	9.828 ³⁷⁶	42.12 ¹⁶³	55.85 ¹³⁶	10.16 ²²
	314	114	63	79	382	102	138	28
19.8	20.942	41.44	5.66	15.14	10.210	41.10	57.23	10.44
Mar. 1.7	21.248 ³⁰⁶	40.75 ⁶⁰	6.30 ⁶⁴	15.02 ¹²	10.586 ³⁷⁶	40.71 ³⁹	58.59 ¹³⁶	11.19 ⁷⁵
11.7	21.542 ²⁹⁴	40.52 ²²	6.90 ⁶⁰	15.59 ⁵⁷	10.948 ³⁸²	40.95 ²⁴	59.92 ¹³³	12.39 ¹²⁰
21.7	21.817 ²⁷⁵	40.74 ²²	7.47 ⁵⁷	16.81 ¹²²	11.286 ³⁸⁶	41.80 ⁸⁵	61.18 ¹²⁶	13.99 ¹⁶⁰
31.6	22.073 ²⁵⁶	41.38 ⁶⁴	7.99 ⁵²	18.61 ¹⁸⁰	11.594 ³⁰⁸	43.22 ¹⁴²	62.34 ¹¹⁶	15.96 ¹⁹⁷
	229	104	44	232	278	191	107	228
Apr. 10.6	22.302	42.42	8.43	20.93	11.867	45.13	63.41	18.24
20.6	22.506 ²⁰⁴	43.78 ¹³⁶	8.79 ³⁶	23.65 ²⁷²	12.102 ²³⁵	47.46 ²³⁸	64.85 ⁹⁴	20.78 ²⁵⁴
30.6	22.682 ¹⁷⁶	45.40 ¹⁶²	9.06 ²⁷	26.68 ³⁰⁸	12.293 ¹⁰¹	50.11 ²⁶⁵	65.16 ⁸¹	23.52 ²⁷⁴
May 10.5	22.828 ¹⁴⁶	47.22 ¹⁸²	9.23 ¹⁷	29.90 ³²²	12.438 ¹⁴⁵	52.97 ²⁸⁶	65.81 ⁶⁵	26.41 ²⁸⁹
20.5	22.942 ¹¹⁸	49.16 ¹⁹⁴	9.30 ⁷	33.22 ³³²	12.536 ⁹⁸	55.95 ²⁹⁸	66.30 ⁴⁰	29.38 ²⁹⁷
	82	200	2	331	80	301	32	300
30.5	23.024	51.16	9.28	36.53	12.586	58.96	66.62	32.38
June 9.5	23.072 ⁴⁸	53.14 ¹⁹⁸	9.17 ¹¹	39.71 ³¹⁸	12.569 ³	61.90 ²⁹⁴	66.75 ¹²	35.32 ²⁹⁴
19.4	23.086 ¹⁴	55.04 ¹⁹⁰	8.96 ²¹	42.66 ²⁹⁵	12.545 ⁴⁴	64.68 ²⁷⁸	66.72 ³	38.14 ²⁸²
29.4	23.065 ²¹	56.83 ¹⁷⁹	8.67 ²⁹	45.35 ²⁶⁹	12.456 ⁸⁹	67.23 ²⁵⁵	66.50 ²²	40.75 ²⁶¹
July 9.4	23.013 ⁵²	58.44 ¹⁶¹	8.30 ³⁷	47.68 ²³³	12.324 ¹³³	69.47 ²²⁴	66.12 ³⁸	43.10 ²³⁵
	84	141	44	191	171	191	53	201
19.3	22.929	59.85	7.86	49.59	12.153	71.38	65.59	45.11
29.3	22.815 ¹¹⁴	61.01 ¹¹⁶	7.38 ⁴⁸	51.02 ¹⁴³	11.946 ²⁰⁷	72.89 ¹⁶¹	64.92 ⁶⁷	46.73 ¹⁶²
Aug. 8.3	22.679 ¹³⁶	61.91 ⁹⁰	6.83 ⁵⁵	51.99 ⁹⁷	11.712 ²³⁴	73.96 ¹⁰⁷	64.12 ⁸⁰	47.89 ¹¹⁶
18.3	22.521 ¹⁵⁸	62.54 ⁶³	6.26 ⁵⁷	52.43 ⁴⁴	11.455 ²⁵⁷	74.58 ⁶²	63.24 ⁸⁸	48.55 ⁶⁶
28.2	22.349 ¹⁷²	62.88 ³⁴	5.67 ⁵⁹	52.37 ⁶	11.184 ²⁷¹	74.74 ¹⁶	62.32 ⁹²	48.68 ¹³
	177	2	59	80	276	31	94	41
Sept. 7.2	22.172	62.90	5.08	51.77	10.908	74.43	61.38	48.27
17.2	21.997 ¹⁷⁵	62.64 ²⁶	4.50 ⁵⁸	50.65 ¹¹²	10.634 ²⁷⁴	73.65 ⁷⁸	60.46 ⁹²	47.32 ⁹⁵
27.2	21.833 ¹⁸⁴	62.05 ⁵⁹	3.94 ⁵⁶	49.05 ¹⁶⁰	10.377 ²⁵⁷	72.39 ¹²⁶	59.00 ⁸⁶	45.86 ¹⁴⁶
Oct. 7.1	21.690 ¹⁴³	61.14 ⁹¹	3.44 ⁵⁰	46.95 ²¹⁰	10.144 ²³³	70.69 ¹⁷⁰	58.96 ⁷⁴	43.93 ¹²⁸
17.1	21.576 ¹¹⁴	59.93 ¹²¹	2.99 ⁴⁵	44.43 ²⁵²	9.948 ¹⁹⁶	68.56 ²¹³	58.25 ⁶¹	41.62 ²³¹
	77	151	37	291	152	251	43	265
27.1	21.499 ³²	58.42	2.62	41.52	9.796 ⁹⁸	66.05	57.82	38.97
Nov. 6.0	21.467 ¹⁵	56.63 ¹⁷⁹	2.34 ²⁸	38.27 ³²⁵	9.698 ³⁹	63.21 ²⁸⁴	57.60 ²²	36.11 ²⁸⁶
16.0	21.482 ⁶⁵	54.59 ²⁰⁴	2.17 ¹⁷	34.78 ³⁴⁹	9.659 ³¹³	60.08 ³¹³	57.59 ¹	33.13 ²⁹⁸
26.0	21.547 ¹¹⁶	52.33 ²³⁶	2.10 ⁷	31.12 ³⁶⁶	9.683 ²⁴	56.76 ³³²	57.81 ²²	30.15 ²⁹⁸
Dec. 6.0	21.663 ¹⁶⁵	49.92 ²⁴¹	2.15 ⁵	27.39 ³⁷³	9.773 ⁹⁰	53.31 ³⁴⁵	58.25 ⁴⁴	27.28 ²⁶⁷
	245	250	16	369	153	346	66	265
15.9	21.828	47.42	2.31	23.70	9.926	49.85	58.91	24.63
25.9	22.036 ²⁰⁸	44.89 ²³³	2.58 ²⁷	20.16 ³⁵⁴	10.139 ²¹³	46.47 ³³⁸	59.75 ⁸⁴	22.28 ²³⁵
35.9	22.281 ²⁴⁵	42.41 ²⁴⁸	2.96 ³⁸	16.88 ³²⁸	10.404 ²⁶⁵	43.29 ³¹⁸	60.78 ¹⁰⁸	20.32 ¹⁹⁶
Mean Place	19.637	61.45	5.472	43.00	9.264	67.12	53.722	20.42
Sec δ , Tan δ	1.047	+0.311	2.672	+2.478	1.418	+1.005	5.012	-4.911
$D\psi\alpha$, $D\omega\alpha$	+0.05	+0.01	0.00	+0.08	+0.04	+0.03	+0.18	-0.16
$D\psi\delta$, $D\omega\delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 3.0		σ Cor. Bor. seq. Mag. 5.8		19 Ursa Minoris. Mag. 5.5		γ^2 Normae. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 9	° ' " 3 28	h m 16 11	° ' " +34 3	h m 16 13	° ' " +76 4	h m 16 13	° ' " -49 57
Jan. 0.9	59.604	59.44	33.679	52.84	5.63	55.52	36.877	8.37
10.9	59.875 ²⁷¹	61.06 ¹⁶¹	33.950 ²⁷¹	49.98 ²⁸⁶	6.20 ⁵⁷	52.49 ³⁰³	37.279 ⁴⁰³	7.77 ⁶⁰
20.8	60.170 ²⁸⁵	62.62 ¹⁵⁷	34.253 ³⁰³	47.44 ²⁵⁴	6.92 ⁷²	49.90 ²⁵⁹	37.716 ⁴³⁷	7.48 ²⁹
30.8	60.479 ³⁰⁹	64.09 ¹⁴⁷	34.577 ³²⁴	45.29 ²¹⁵	7.74 ⁸²	47.84 ²⁰⁶	38.175 ⁴⁵⁹	7.49 ¹
Feb. 9.8	60.792 ³¹³	65.40 ¹³¹	34.913 ³³⁶	43.62 ¹⁶⁷	8.63 ⁸⁹	46.39 ¹⁴⁵	38.645 ⁴⁷⁰	7.82 ³³
19.8	61.105 ³¹³	66.50 ¹¹⁰	35.253 ³⁴⁰	42.49 ¹¹³	9.57 ⁹⁴	45.59 ⁸⁰	39.116 ⁴⁷¹	8.43 ⁶¹
Mar. 1.7	61.409 ³⁰⁴	67.37 ⁸⁷	35.588 ³³⁵	41.93 ⁵⁶	10.51 ⁹⁴	45.48 ¹¹	39.579 ⁴⁶³	9.27 ⁸⁴
11.7	61.703 ²⁹⁴	67.96 ⁵⁹	35.911 ³²³	41.95 ²	11.43 ⁹²	46.05 ⁵⁷	40.027 ⁴⁴⁸	10.33 ¹⁰⁶
21.7	61.981 ²⁷⁸	68.27 ³¹	36.214 ³⁰⁸	42.54 ⁵⁹	12.29 ⁸⁶	47.25 ¹²⁰	40.455 ⁴²⁸	11.59 ¹²⁶
31.7	62.240 ²⁵⁹	68.33 ⁶	36.495 ²⁸¹	43.65 ¹¹¹	13.07 ⁷⁸	49.04 ¹⁷⁹	40.855 ⁴⁰⁰	12.99 ¹⁴⁰
Apr. 10.6	62.480 ²⁴⁰	68.12 ²¹	36.746 ²⁵¹	45.23 ¹⁵⁸	13.73 ⁶⁶	51.34 ²⁸⁰	41.226 ³⁷¹	14.53 ¹⁵⁴
20.6	62.693 ²¹³	67.70 ⁴²	36.966 ²²⁰	47.22 ¹⁹⁹	14.27 ⁵⁴	54.05 ²⁷¹	41.562 ³³⁶	16.18 ¹⁶⁵
30.6	62.883 ¹⁹⁰	67.08 ⁶²	37.152 ¹⁸⁶	49.51 ²²⁹	14.67 ⁴⁰	57.08 ³⁰³	41.860 ²⁹⁸	17.89 ¹⁷¹
May 10.5	63.046 ¹⁶³	66.33 ⁷⁵	37.300 ¹⁴⁸	52.03 ²⁵²	14.90 ²³	60.30 ³²²	42.116 ²⁵⁶	19.65 ¹⁷⁶
20.5	63.181 ¹³⁵	65.48 ⁸⁵	37.411 ¹¹¹	54.68 ²⁶⁵	14.99 ⁹	63.61 ³³¹	42.326 ²¹⁰	21.42 ¹⁷⁷
30.5	63.285 ¹⁰⁴	64.56 ⁹²	37.483 ⁷²	57.38 ²⁷⁰	14.92 ⁷	66.90 ³²⁹	42.487 ¹⁶¹	23.17 ¹⁷⁵
June 9.5	63.358 ⁷³	63.62 ⁹⁴	37.514 ³¹	60.04 ²⁶⁶	14.70 ²²	70.08 ³¹⁸	42.597 ¹¹⁰	24.87 ¹⁷⁰
19.4	63.397 ³⁹	62.68 ⁹¹	37.506 ⁸	62.57 ²⁸³	14.33 ³⁷	73.04 ²⁹⁶	42.653 ⁵⁶	26.46 ¹⁵⁹
29.4	63.403 ⁶	61.77 ⁹⁴	37.459 ⁴⁷	64.93 ²⁸⁶	13.83 ⁵⁰	75.72 ²⁶⁸	42.654 ¹	27.92 ¹⁴⁶
July 9.4	63.376 ²⁷	60.92 ⁸⁵	37.373 ⁸⁶	67.03 ²¹⁰	13.21 ⁶²	78.05 ²⁸³	42.602 ⁵²	29.22 ¹³⁰
19.4	63.316 ⁶⁰	60.14 ⁷⁸	37.252 ¹²¹	68.85 ¹⁸²	12.48 ⁷³	79.96 ¹⁹¹	42.498 ¹⁰⁴	30.29 ¹⁰⁷
29.3	63.227 ⁸⁹	59.44 ⁷⁰	37.100 ¹⁵²	70.32 ¹⁴⁷	11.66 ⁸²	81.42 ¹⁴⁶	42.347 ¹⁵¹	31.10 ⁸¹
Aug. 8.3	63.111 ¹¹⁶	58.84 ⁶⁰	36.921 ¹⁷⁹	71.42 ¹¹⁰	10.77 ⁸⁹	82.39 ⁹⁷	42.155 ¹⁹²	31.64 ⁵⁴
18.3	62.975 ¹³⁶	58.34 ⁵⁰	36.719 ²⁰²	72.13 ⁷¹	9.84 ⁹³	82.84 ⁴⁵	41.930 ²²⁵	31.86 ²²
28.2	62.824 ¹⁵¹	57.94 ⁴⁰	36.501 ²¹⁸	72.42 ²⁹	8.87 ⁹⁷	82.79 ⁵	41.683 ²⁴⁷	31.75 ¹¹
Sept. 7.2	62.665 ¹⁸⁹	57.68 ²⁶	36.278 ²²³	72.31 ¹¹	7.90 ⁹⁷	82.22 ⁵⁷	41.426 ²⁵⁷	31.31 ⁴⁴
17.2	62.507 ¹⁵⁸	57.53 ¹⁵	36.056 ²²²	71.76 ⁵⁵	6.95 ⁹⁵	81.13 ¹⁰⁹	41.172 ²⁵⁴	30.53 ⁷⁸
27.2	62.359 ¹⁴⁶	57.53 ⁰	35.847 ²⁰⁹	70.80 ⁹⁶	6.04 ⁹¹	79.55 ¹⁵⁸	40.935 ²³⁷	29.45 ¹⁰⁸
Oct. 7.1	62.232 ¹²⁷	57.68 ¹⁵	35.658 ¹⁸⁹	69.44 ¹²⁶	5.19 ⁸⁵	77.50 ²⁰⁵	40.731 ²⁰⁴	28.11 ¹³⁴
17.1	62.132 ¹⁰⁰	58.01 ³³	35.500 ¹⁶⁸	67.67 ¹⁷⁷	4.44 ⁷⁵	75.01 ²⁴⁹	40.571 ¹⁶⁰	26.56 ¹⁵⁵
27.1	62.069 ⁶³	58.51 ⁵⁰	35.382 ¹¹⁸	65.53 ²¹⁴	3.79 ⁶⁵	72.15 ²⁸⁶	40.467 ¹⁰⁴	24.84 ¹⁷²
Nov. 6.1	62.050 ¹⁹	59.22 ⁷¹	35.311 ⁷¹	63.07 ²⁴⁶	3.28 ⁵¹	68.96 ³¹⁹	40.431 ³⁶	23.05 ¹⁷⁹
16.0	62.078 ²⁸	60.11 ⁸⁹	35.292 ¹⁹	60.33 ²⁷⁴	2.92 ³⁶	65.52 ³⁴⁴	40.468 ⁸⁷	21.25 ¹⁸⁰
26.0	62.156 ⁷⁸	61.20 ¹⁰⁹	35.329 ³⁷	57.37 ²⁹⁶	2.73 ¹⁹	61.91 ³⁶¹	40.578 ¹¹⁰	19.53 ¹⁷²
Dec. 6.0	62.284 ¹²⁸	62.47 ¹²⁷	35.423 ⁹⁴	54.26 ³¹¹	2.70 ³	58.22 ³⁶⁹	40.764 ¹⁸⁶	17.96 ¹⁵⁷
15.9	62.458 ¹⁷⁴	63.88 ¹⁴¹	35.571 ¹⁴⁸	51.10 ³¹⁶	2.86 ¹⁶	54.57 ³⁶⁵	41.020 ²⁵⁶	16.58 ¹³⁸
25.9	62.674 ²¹⁶	65.40 ¹⁵²	35.771 ²⁰⁰	47.98 ³¹²	3.19 ³³	51.07 ³⁵⁰	41.337 ³¹⁷	15.47 ¹¹¹
35.9	62.925 ²⁶¹	66.99 ¹⁵⁹	36.016 ²⁴⁵	45.00 ²⁹⁸	3.67 ⁴⁸	47.83 ³²⁴	41.708 ³⁷¹	14.66 ⁸¹
Mean Place	59.656	53.21	34.188	66.39	10.417	73.09	37.194	11.27
Sec δ , Tan δ	1.002	-0.061	1.207	+0.676	4.158	+4.036	1.554	-1.190
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.05	+0.02	-0.03	+0.12	+0.09	-0.04
$D\psi\delta$, $D\omega\delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Ophiuchi. Mag. 3.3		σ Scorpii. Mag. 3.1		τ Herculis. Mag. 3.9		γ Herculis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 13	° ' " - 4 29	h m 16 16	° ' " -25 23	h m 16 17	° ' " +46 30	h m 16 18	° ' " +19 20
	s "	"	s "	"	s "	"	s "	"
Jan. 0.9	55.608	33.79	8.363	42.42	13.826	22.48	15.200	39.24
10.9	55.879	35.33	8.665	42.97	14.113	19.41	15.458	36.78
20.8	56.172	36.84	8.990	43.66	14.440	16.69	15.741	34.51
30.8	56.480	38.27	9.331	44.44	14.799	14.43	16.043	32.55
Feb. 9.8	56.794	39.55	9.680	45.30	15.177	12.72	16.355	30.95
19.8	57.107	40.63	10.028	46.19	15.563	11.60	16.669	29.77
Mar. 1.7	57.413	41.49	10.369	47.06	15.947	11.12	16.978	29.05
11.7	57.709	42.08	10.699	47.91	16.319	11.28	17.276	28.81
21.7	57.990	42.40	11.013	48.70	16.670	12.07	17.560	29.04
31.7	58.251	42.47	11.307	49.41	16.994	13.43	17.824	29.73
Apr. 10.6	58.493	42.28	11.581	50.07	17.283	15.31	18.066	30.82
20.6	58.712	41.90	11.830	50.65	17.532	17.63	18.281	32.25
30.6	58.907	41.33	12.051	51.16	17.738	20.29	18.470	33.98
May 10.5	59.074	40.60	12.245	51.61	17.899	23.18	18.628	35.91
20.5	59.214	39.79	12.408	52.01	18.011	26.22	18.754	37.97
30.5	59.323	38.91	12.537	52.36	18.074	29.29	18.848	40.11
June 9.5	59.400	38.01	12.632	52.66	18.087	32.30	18.907	42.23
19.4	59.444	37.11	12.689	52.90	18.051	35.18	18.930	44.29
29.4	59.454	36.24	12.708	53.11	17.968	37.83	18.918	46.22
July 9.4	59.430	35.41	12.689	53.26	17.839	40.20	18.872	47.98
19.4	59.373	34.66	12.632	53.33	17.668	42.22	18.792	49.51
29.3	59.287	33.99	12.542	53.83	17.460	43.85	18.681	50.80
Aug. 8.3	59.173	33.39	12.421	53.24	17.221	45.06	18.544	51.83
18.3	59.038	32.89	12.275	53.03	16.956	45.81	18.384	52.55
28.2	58.887	32.49	12.110	52.74	16.675	46.10	18.209	52.97
Sept. 7.2	58.728	32.20	11.937	52.35	16.386	45.90	18.026	53.07
17.2	58.569	32.04	11.764	51.87	16.099	45.22	17.843	52.84
27.2	58.420	32.00	11.603	51.31	15.825	44.07	17.669	52.27
Oct. 7.1	58.291	32.11	11.462	50.71	15.575	42.46	17.514	51.39
17.1	58.188	32.38	11.353	50.10	15.360	40.42	17.387	50.18
27.1	58.123	32.82	11.285	49.51	15.189	37.97	17.294	48.65
Nov. 6.1	58.101	33.46	11.265	48.98	15.071	35.17	17.244	46.83
16.0	58.127	34.28	11.297	48.55	15.012	32.07	17.243	44.74
26.0	58.202	35.28	11.385	48.28	15.019	28.76	17.293	42.44
Dec. 6.0	58.327	36.47	11.529	48.16	15.091	25.31	17.393	39.97
15.9	58.498	37.81	11.723	48.22	15.229	21.81	17.543	37.38
25.9	58.712	39.26	11.963	48.48	15.427	18.39	17.737	34.79
35.9	58.962	40.78	12.241	48.91	15.682	15.15	17.970	32.26
Mean Place	55.670	27.83	8.421	40.82	14.756	37.45	15.476	49.87
Sec δ , Tan δ	1.003	-0.079	1.107	-0.475	1.453	+1.054	1.060	+0.351
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.07	-0.01	+0.04	+0.03	+0.05	+0.01
$D\psi\delta$, $D\omega\delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ursæ Minoris. Mag. 5.0		γ Apodis. Mag. 3.9		ω Herculis. Mag. 4.5		γ Draconis. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 19	° ' " +75 56	h m 16 20	° ' " -78 42	h m 16 21	° ' " +14 13	h m 16 22	° ' " +61 41
Jan. 0.9	49.88	32.61	37.53	41.62	34.620	15.25	49.92	50.46
10.9	50.43	29.54	38.62	39.78	34.876	12.96	50.26	47.27
20.9	51.12	26.90	39.84	38.38	35.155	10.86	50.67	44.47
30.8	51.91	24.77	41.16	37.46	35.452	8.98	51.13	42.18
Feb. 9.8	52.79	23.24	42.54	37.04	35.760	7.43	51.62	40.47
19.8	53.71	22.37	43.94	37.10	36.070	6.25	52.13	39.40
Mar. 1.7	54.64	22.17	45.33	37.63	36.374	5.49	52.65	39.02
11.7	55.55	22.66	46.70	38.62	36.670	5.16	53.16	39.31
21.7	56.42	23.78	48.01	40.01	36.951	5.26	53.64	40.27
31.7	57.20	25.60	49.24	41.79	37.213	5.78	54.08	41.84
Apr. 10.6	57.87	27.73	50.37	43.90	37.455	6.69	54.47	43.95
20.6	58.42	30.40	51.38	46.30	37.672	7.92	54.80	46.50
30.6	58.84	33.40	52.25	48.93	37.864	9.41	55.06	49.39
May 10.6	59.10	36.60	52.97	51.73	38.026	11.10	55.25	52.55
20.5	59.21	39.92	53.53	54.64	38.159	12.93	55.36	55.84
30.5	59.17	43.24	53.91	57.61	38.260	14.83	55.40	59.15
June 9.5	58.97	46.45	54.12	60.55	38.326	16.73	55.37	62.40
19.4	58.63	49.47	54.14	63.39	38.359	18.58	55.27	65.48
29.4	58.16	52.23	53.97	66.06	38.358	20.33	55.09	68.32
July 9.4	57.55	54.63	53.63	68.50	38.321	21.92	54.85	70.84
19.4	56.85	56.64	53.12	70.62	38.252	23.33	54.55	72.96
29.3	56.05	58.20	52.47	72.36	38.153	24.52	54.20	74.69
Aug. 8.3	55.18	59.23	51.69	73.67	38.024	25.49	53.80	75.93
18.3	54.26	59.85	50.81	74.49	37.875	26.19	53.36	76.68
28.3	53.30	59.91	49.86	74.79	37.709	26.63	52.91	76.92
Sept. 7.2	52.34	59.44	48.89	74.55	37.534	26.79	52.46	76.65
17.2	51.39	58.46	47.93	73.76	37.359	26.66	52.00	75.85
27.2	50.47	56.99	47.04	72.45	37.193	26.24	51.56	74.54
Oct. 7.1	49.62	55.04	46.24	70.65	37.043	25.53	51.17	72.75
17.1	48.85	52.65	45.58	68.43	36.921	24.53	50.81	70.50
27.1	48.18	49.87	45.09	65.86	36.834	23.23	50.50	67.83
Nov. 6.1	47.66	46.75	44.79	63.04	36.788	21.65	50.27	64.79
16.0	47.28	43.37	44.73	60.07	36.790	19.83	50.12	61.47
26.0	47.06	39.79	44.88	57.07	36.841	17.78	50.05	57.91
Dec. 6.0	47.01	36.13	45.26	54.15	36.942	15.57	50.09	54.24
15.9	47.13	32.49	45.87	51.40	37.091	13.24	50.21	50.55
25.9	47.43	28.98	46.68	48.94	37.285	10.88	50.42	46.97
35.9	47.89	25.71	47.68	46.83	37.517	8.53	50.71	43.59
Mean Place	54.741	49.54	40.624	47.43	34.845	24.78	51.890	66.46
Sec δ, Tan δ	4.118	+3.994	5.110	-5.012	1.032	+0.253	2.109	+1.857
D _ψ α, D _α α	-0.03	+0.11	+0.18	-0.14	+0.05	+0.01	+0.02	+0.05
D _ψ δ, D _α δ	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

APPARENT PLACES OF STARS, 1917.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Scorpii. (Antares.) Mag. 1.2		β Herculis. Mag. 2.8		λ Ophiuchi. Mag. 3.8		Δ Draconis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 24	° ' " -26 14	h m 16 26	° ' " +21 39	h m 16 26	° ' " + 2 9	h m 16 28	° ' " +68 56
Jan. 0.9	18.837	57.29	38.687	59.85	43.416	45.88	5.29	35.89
10.9	19.135 ²⁹⁸	57.73 ⁴⁴	38.938 ²⁵¹	57.31 ²⁵⁴	43.672 ²⁵⁶	44.08 ¹⁸⁰	5.69 ⁴⁰	32.69 ³²⁰
20.9	19.458 ³²³	58.32 ⁵⁹	39.216 ²⁷⁸	54.97 ²³⁴	43.952 ²⁸⁰	42.36 ¹⁷²	6.17 ⁴⁸	29.89 ²⁸⁰
30.8	19.797 ³³⁹	59.02 ⁷⁰	39.516 ³⁰⁰	52.94 ²⁰³	44.248 ²⁹⁶	40.79 ¹⁵⁷	6.73 ⁵⁶	27.60 ²²⁹
Feb. 9.8	20.145 ³⁴⁸	59.79 ⁷⁷	39.826 ³¹⁰	51.29 ¹⁰⁵	44.554 ³⁰⁶	39.42 ¹³⁷	7.94 ⁶¹	25.89 ¹⁷¹
19.8	20.495 ³⁵⁰	60.60 ⁸¹	40.141 ³¹⁵	50.08 ¹²¹	44.862 ³⁰⁸	38.32 ¹¹⁰	7.99 ⁶⁵	24.82 ¹⁰⁷
Mar. 1.7	20.840 ³⁴⁵	61.41 ⁸¹	40.453 ³¹²	49.34 ⁷⁴	45.165 ³⁰³	37.51 ⁸¹	8.65 ⁶⁶	24.45 ³⁷
11.7	21.174 ³³⁴	62.19 ⁷⁸	40.756 ³⁰⁸	49.10 ²⁴	45.460 ²⁹⁶	37.02 ⁴⁹	9.29 ⁶⁴	24.75 ³⁰
21.7	21.494 ³²⁰	62.93 ⁷⁴	41.045 ²⁸⁹	49.35 ²⁵	45.742 ²⁸²	36.87 ¹⁵	9.91 ⁶²	25.73 ⁹⁸
31.7	21.795 ³⁰¹	63.61 ⁶⁸	41.316 ²⁷¹	50.07 ⁷²	46.006 ²⁶⁴	37.08 ¹⁶	10.47 ⁵⁶	27.31 ¹⁵⁸
Apr. 10.6	22.077 ²⁸²	64.23 ⁶²	41.564 ²⁴⁸	51.22 ¹¹⁵	46.252 ²⁴⁶	37.48 ⁴⁵	10.97 ⁵⁰	29.43 ²¹²
20.6	22.394 ²⁵⁷	64.79 ⁵⁶	41.787 ²²²	52.74 ¹⁵²	46.476 ²²⁴	38.21 ⁷³	11.38 ⁴¹	32.01 ²⁵⁸
30.6	22.567 ²³³	65.30 ⁵¹	41.983 ¹⁹⁶	54.55 ¹⁸¹	46.675 ¹⁹⁹	39.14 ⁹³	11.70 ³²	34.95 ²⁹⁴
May 10.6	22.770 ²⁰³	65.76 ⁴⁶	42.148 ¹⁶⁵	56.60 ²⁰⁶	46.848 ¹⁷⁸	40.24 ¹¹⁰	11.94 ²⁴	38.13 ³¹⁸
20.5	22.943 ¹⁷³	66.17 ⁴¹	42.282 ¹³⁴	58.78 ²¹⁸	46.994 ¹⁴⁶	41.47 ¹²³	12.07 ¹³	41.45 ³³²
30.5	23.083 ¹⁴⁰	66.54 ³⁷	42.382 ¹⁰⁰	61.03 ²²⁵	47.109 ¹¹⁵	42.75 ¹²⁸	12.10 ³	44.81 ³³⁶
June 9.5	23.186 ¹⁰³	66.88 ³⁴	42.446 ⁶⁴	63.29 ²²⁶	47.192 ⁸³	44.06 ¹³¹	12.03 ⁷	48.10 ³²⁹
19.4	23.251 ⁶⁵	67.17 ²⁹	42.474 ²⁸	65.47 ²¹⁸	47.242 ⁵⁰	45.35 ¹²⁹	11.85 ¹⁸	51.21 ³¹¹
29.4	23.277 ²⁶	67.41 ²⁴	42.465 ⁹	67.52 ²⁰⁶	47.257 ¹⁵	46.58 ¹²³	11.59 ²⁶	54.09 ²⁸⁸
July 9.4	23.264 ¹³	67.61 ²⁰	42.421 ⁴⁴	69.40 ¹⁸⁸	47.238 ¹⁹	47.72 ¹¹⁴	11.24 ³⁵	56.64 ²⁵⁵
19.4	23.214 ⁵⁰	67.74 ¹³	42.342 ⁷⁹	71.05 ¹⁶⁶	47.185 ⁵³	48.75 ¹⁰³	10.81 ⁴³	58.81 ²¹⁷
29.3	23.126 ⁸⁸	67.78 ⁴	42.230 ¹¹²	72.45 ¹⁴⁰	47.100 ⁸⁵	49.65 ⁹⁰	10.32 ⁴⁹	60.55 ¹⁷⁴
Aug. 8.3	23.007 ¹¹⁹	67.74 ⁴	42.091 ¹³⁹	73.56 ¹¹¹	46.988 ¹¹²	50.39 ⁷⁴	9.77 ⁵⁵	61.81 ¹²⁶
18.3	22.862 ¹⁴⁵	67.60 ¹⁴	41.928 ¹⁶³	74.35 ⁷⁹	46.853 ¹³⁵	50.99 ⁶⁰	9.18 ⁵⁹	62.58 ⁷⁷
28.3	22.696 ¹⁶⁶	67.34 ²⁶	41.748 ¹⁸⁰	74.83 ⁴⁸	46.700 ¹⁵³	51.43 ⁴⁴	8.56 ⁶²	62.84 ²⁶
Sept. 7.2	22.521 ¹⁷⁵	66.98 ³⁶	41.559 ¹⁸⁹	74.96 ¹⁸	46.536 ¹⁶⁴	51.68 ²⁵	7.93 ⁶³	62.57 ²⁷
17.2	22.344 ¹⁷⁷	66.52 ⁴⁶	41.368 ¹⁹¹	74.74 ²²	46.373 ¹⁶³	51.76 ⁸	7.30 ⁶³	61.78 ⁷⁹
27.2	22.178 ¹⁶⁶	65.98 ⁵⁴	41.185 ¹⁸³	74.18 ⁵⁶	46.216 ¹⁵⁷	51.65 ¹¹	6.69 ⁶¹	60.47 ¹³¹
Oct. 7.1	22.031 ¹⁴⁷	65.39 ⁵⁹	41.021 ¹⁶⁴	73.28 ⁹⁰	46.075 ¹⁴¹	51.33 ³²	6.12 ⁵⁷	58.68 ¹⁷⁹
17.1	21.916 ¹¹⁵	64.76 ⁶²	40.882 ¹³⁹	72.08 ¹²⁵	45.962 ¹¹³	50.80 ⁵³	5.61 ⁵¹	56.42 ²²⁶
27.1	21.841 ⁷⁸	64.14 ⁶²	40.779 ¹⁰³	70.45 ¹⁵⁸	45.883 ⁷⁸	50.05 ⁷⁵	5.18 ⁴³	53.74 ²⁶⁸
Nov. 6.1	21.813 ²⁸	63.57 ⁵⁷	40.718 ⁶¹	68.58 ³⁹	45.845 ³⁸	49.10 ⁹⁵	4.83 ³⁵	50.70 ³⁰⁴
16.0	21.837 ²⁴	63.09 ⁴⁸	40.705 ¹³	66.42 ²¹⁶	45.853 ⁵	47.93 ¹¹⁷	4.58 ²⁶	47.37 ³³³
26.0	21.917 ⁸⁰	62.74 ³⁵	40.743 ³⁸	64.04 ²³⁸	45.910 ⁸	46.56 ¹³⁷	4.45 ¹³	43.81 ³⁵⁶
Dec. 6.0	22.052 ¹³⁵	62.55 ¹⁹	40.833 ⁹⁰	61.47 ²⁵⁷	46.016 ¹⁰⁶	45.03 ¹⁵³	4.43 ²	40.13 ³⁶⁸
16.0	22.239 ¹⁸⁷	62.52 ³	40.972 ¹³⁹	58.81 ²⁶⁶	46.170 ¹⁵⁴	43.34 ¹⁶⁹	4.53 ¹⁰	36.43 ³⁷⁰
25.9	22.473 ²³⁴	62.69 ¹⁷	41.157 ¹⁸⁵	56.12 ²⁶⁹	46.367 ¹⁹⁷	41.57 ¹⁷⁷	4.75 ²²	32.84 ³⁵⁹
35.9	22.746 ²⁷³	63.02 ³³	41.383 ²²⁶	53.50 ²⁶²	46.599 ²³²	39.77 ¹⁸⁰	5.09 ²⁴	29.46 ³³⁸
Mean Place	18.923	55.76	39.031	70.50	43.554	52.94	8.325	51.84
Sec δ , Tan δ	1.115	-0.493	1.076	+0.397	1.001	+0.038	2.783	+2.598
$D\psi\alpha$, $D_\omega\alpha$	+0.07	-0.01	+0.05	+0.01	+0.06	0.00	0.00	+0.07
$D\psi\delta$, $D_\omega\delta$	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9	-0.2	-0.9

APPARENT PLACES OF STARS, 1917.

449

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Scorpii. Mag. 2.9		σ Herculis. Mag. 4.2		ζ Ophiuchi. Mag. 2.7		η Scorpii. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 30	° ' " 2	h m 16 31	° ' " 36	h m 16 32	° ' " 23	h m 16 36	° ' " 34
Jan. 0.9	42.631	42.91	24.749	13.35	35.093	64.21	46.116	60.01
10.9	42.929 ²⁹⁸	43.22 31	25.012 ²⁶³	10.27 ³⁰⁸	35.357 ²⁶⁴	65.41 ¹²⁰	46.386 ²⁷⁰	60.82 81
20.9	43.252 ³²³	43.68 46	25.315 ³⁰⁸	7.52 ²⁷⁵	35.645 ²⁸⁸	66.62 ¹²¹	46.683 ²⁹⁷	61.69 87
30.8	43.593 ³⁴¹	44.25 57	25.648 ³³³	5.19 ²³³	35.951 ³⁰⁶	67.79 ¹¹⁷	46.997 ³¹⁴	62.60 91
Feb. 9.8	43.946 ³⁵³	44.92 67	26.003 ³⁵⁵	3.36 ¹⁸³	36.266 ³¹⁵	68.88 ¹⁰⁹	47.322 ³²⁵	63.49 89
19.8	44.300 ³⁵⁴	45.66 74	26.367 ³⁶⁴	2.10 ¹²⁶	36.583 ³¹⁷	69.84 ⁹⁶	47.649 ³²⁷	64.32 83
Mar. 1.7	44.649 ³⁴⁹	46.41 75	26.732 ³⁶⁵	1.46 ⁶⁴	36.896 ³¹³	70.62 ⁷⁸	47.974 ³²⁵	65.06 74
11.7	44.990 ³⁴¹	47.15 74	27.088 ³⁵⁶	1.45 ¹	37.201 ³⁰⁵	71.22 ⁶⁰	48.291 ³¹⁷	65.69 63
21.7	45.318 ³²⁸	47.86 71	27.429 ³⁴¹	2.05 ⁶⁰	37.494 ²⁹³	71.81 ³⁹	48.595 ³⁰⁴	66.19 50
31.7	45.627 ³⁰⁹	48.54 68	27.746 ³¹⁷	3.24 ¹¹⁹	37.771 ²⁷⁷	71.79 ¹⁸	48.885 ²⁹⁰	66.56 37
Apr. 10.6	45.917 ²⁹⁰	49.19 65	28.035 ²⁸⁹	4.94 ¹⁷⁰	38.030 ²⁵⁹	71.77 ²	49.157 ²⁷²	66.77 21
20.6	46.184 ²⁶⁷	49.79 60	28.289 ²⁵⁴	7.09 ²¹⁵	38.269 ²³⁹	71.57 ²⁰	49.407 ²⁶⁰	66.88 11
30.6	46.426 ²⁴²	50.34 55	28.506 ²¹⁷	9.61 ²⁵²	38.484 ²¹⁵	71.24 ³³	49.635 ²²³	66.89 1
May 10.6	46.638 ²¹²	50.86 52	28.681 ¹⁷⁵	12.38 ²⁷⁷	38.674 ¹⁹⁰	70.79 ⁴⁵	49.836 ²⁰¹	66.81 8
20.5	46.820 ¹⁸³	51.34 48	28.812 ¹³¹	15.32 ²⁹⁴	38.835 ¹⁶¹	70.25 ⁵⁴	50.009 ¹⁷³	66.66 15
30.5	46.968 ¹⁴⁸	51.80 46	28.898 ⁸⁶	18.32 ³⁰⁰	38.967 ¹³²	69.65 ⁶⁰	50.152 ¹⁴³	66.47 19
June 9.5	47.079 ¹¹¹	52.23 43	28.937 ³⁹	21.31 ²⁹⁹	39.066 ⁹⁹	69.03 ⁶²	50.260 ¹⁰⁸	66.26 21
19.4	47.152 ⁷³	52.62 39	28.930 ⁷	24.19 ²⁶⁸	39.130 ⁶⁴	68.41 ⁶²	50.333 ⁷³	66.03 23
29.4	47.184 ³²	52.96 34	28.877 ⁵³	26.87 ²⁶⁸	39.158 ²⁸	67.80 ⁶¹	50.368 ³⁵	65.79 24
July 9.4	47.176 ⁸	53.25 29	28.779 ⁹⁸	29.30 ²⁴³	39.150 ⁸	67.21 ⁵⁹	50.366 ²	65.55 24
19.4	47.130 ⁴⁶	53.46 21	28.640 ¹³⁹	31.42 ²¹²	39.108 ⁴²	66.66 ⁵⁵	50.327 ³⁹	65.31 24
29.3	47.045 ⁸⁵	53.59 18	28.462 ¹⁷⁸	33.18 ¹⁷⁶	39.032 ⁷⁶	66.16 ⁵⁰	50.253 ⁷⁴	65.07 24
Aug. 8.3	46.926 ¹¹⁹	53.62 3	28.250 ²¹²	34.53 ¹³⁵	38.925 ¹⁰⁷	65.70 ⁴⁶	50.147 ¹⁰⁶	64.81 26
18.3	46.780 ¹⁴⁶	53.64 8	28.013 ²³⁷	35.46 ⁹⁸	38.794 ¹³¹	65.28 ⁴²	50.015 ¹³²	64.54 27
28.3	46.613 ¹⁶⁷	53.33 21	27.756 ²⁵⁷	35.94 ⁴⁸	38.645 ¹⁴⁹	64.92 ³⁶	49.862 ¹⁵³	64.25 29
Sept. 7.2	46.435 ¹⁷⁸	53.01 32	27.490 ²⁶⁶	35.95 ¹	38.484 ¹⁶¹	64.61 ³¹	49.695 ¹⁶⁷	63.95 30
17.2	46.254 ¹⁸¹	52.57 44	27.222 ²⁶⁸	35.50 ⁴⁵	38.319 ¹⁶⁵	64.37 ²⁴	49.527 ¹⁶⁸	63.63 32
27.2	46.082 ¹⁷²	52.03 54	26.964 ²⁵⁸	34.58 ⁹²	38.162 ¹⁵⁷	64.19 ¹⁸	49.365 ¹⁶²	63.32 31
Oct. 7.1	45.929 ¹⁵³	51.41 62	26.725 ²³⁹	33.20 ¹³⁸	38.022 ¹⁴⁰	64.10 ⁹	49.220 ¹⁴⁵	63.02 30
17.1	45.807 ¹²²	50.73 68	26.517 ²⁰⁸	31.38 ¹⁸²	37.909 ¹¹³	64.12 ²	49.102 ¹¹⁸	62.77 26
27.1	45.724 ⁸³	50.04 69	26.249 ¹⁶⁸	29.16 ²²²	37.783 ⁷⁸	64.25 ¹³	49.020 ⁸²	62.58 19
Nov. 6.1	45.689 ³⁵	49.39 65	26.230 ¹¹⁹	26.57 ²⁶⁹	37.795 ⁸⁶	64.25 ²⁹	48.981 ³⁹	62.48 10
16.0	45.706 ¹⁷	48.80 59	26.166 ⁶⁴	23.67 ²⁸⁰	37.806 ¹¹	64.54 ²⁹	48.990 ⁹	62.49 1
26.0	45.780 ⁷⁴	48.32 48	26.163 ³	20.52 ³¹⁵	37.867 ⁶¹	64.98 ⁴⁴	49.052 ⁶⁰	62.49 15
Dec. 6.0	45.910 ¹³⁰	47.99 33	26.221 ⁵⁸	17.21 ³³¹	37.978 ¹¹¹	65.58 ⁷⁸	49.052 ¹¹³	62.64 32
16.0	46.093 ¹⁸³	47.83 16	26.341 ¹²⁰	13.82 ³³⁹	38.138 ¹⁶⁰	66.36 ⁹²	49.165 ¹⁶³	62.96 46
25.9	46.324 ²³¹	47.85 2	26.520 ¹⁷⁹	10.47 ³³⁵	38.342 ²⁰⁴	67.28 ¹⁰⁵	49.328 ²⁰⁸	63.42 61
35.9	46.596 ²⁷²	48.05 20	26.751 ²³¹	7.25 ³²²	38.581 ²³⁹	68.33 ¹¹³	49.536 ²⁴⁹	64.03 73
Mean Place	42.742	41.64	25.615	26.80	35.194	59.67	46.219	56.80
Sec δ , Tan δ	1.133	-0.533	1.359	+0.920	1.017	-0.184	1.049	-0.317
D ϕ α , D ω α	+0.07	-0.01	+0.04	+0.02	+0.07	0.00	+0.07	-0.01
D ϕ δ , D ω δ	-0.2	-0.9	-0.2	-0.9	-0.1	-0.9	-0.1	-0.9

39398°—1917—29

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Herculis. Mag. 3.0		α Triang. Aust. Mag. 1.9		γ Herculis. Mag. 3.6		Groombridge 2377. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	16 38	+31 44	16 39	-68 52	16 40	+39 4	16 43	+56 55
Jan. 0.9	8.835	57.32	50.40	33.37	2.192	33.37	41.630	33.68
10.9	9.078 243	54.47 285	51.01 61	31.66 171	2.441 249	30.33 304	41.914 284	30.39 329
20.9	9.355 277	51.89 258	51.69 68	30.33 133	2.728 287	27.59 274	42.258 344	27.45 294
30.8	9.659 304	49.66 223	52.42 73	29.38 95	3.046 318	25.24 235	42.650 392	24.97 248
Feb. 9.8	9.978 319	47.86 180	53.19 77	28.87 51	3.384 338	23.36 188	43.077 427	23.03 194
	328	129	79	9	348	133	451	132
19.8	10.306	46.57 74	53.98	28.78	3.732	22.03	43.528	21.71
Mar. 1.8	10.635 329	45.83 18	54.77 79	29.09 31	4.083 351	21.29 13	43.986 458	21.04 67
11.7	10.957 322	45.65 74	55.55 78	29.79 70	4.428 345	21.16 49	44.440 454	21.05 1
21.7	11.265 308	46.04 39	56.31 76	30.86 107	4.759 331	21.65 49	44.877 437	21.72 67
31.7	11.556 291	46.96 92	57.03 72	32.24 138	5.069 310	22.70 105	45.285 408	23.02 130
	287	141	67	169	286	157	371	188
Apr. 10.6	11.823	48.37	57.70	33.93	5.355	24.27	45.656	24.90
20.6	12.064 241	50.21 184	58.31 61	35.87 194	5.610 255	26.29 202	45.982 326	27.25 235
30.6	12.273 209	52.39 218	58.85 54	38.04 217	5.830 220	28.67 238	46.254 272	29.99 274
May 10.6	12.448 175	54.83 244	59.33 48	40.37 223	6.012 182	31.34 267	46.469 215	33.03 304
20.5	12.590 142	57.45 262	59.72 39	42.83 246	6.155 143	34.17 283	46.621 152	36.25 322
	102	269	80	252	100	293	87	331
30.5	12.692	60.14	60.02	45.35	6.255	37.10	46.708	39.56
June 9.5	12.754 62	62.84 270	60.23 21	47.89 254	6.311 56	40.02 292	46.730 22	42.85 329
19.5	12.777 23	65.45 261	60.32 9	50.37 248	6.323 12	42.85 283	46.687 43	46.03 318
29.4	12.759 18	67.93 248	60.32 0	52.74 237	6.289 34	45.51 266	46.581 106	49.01 296
July 9.4	12.700 59	70.19 226	60.22 10	54.93 219	6.212 77	47.95 244	46.415 166	51.72 271
	95	199	19	195	118	213	223	236
19.4	12.605	72.18	60.03	56.88	6.094	50.08	46.192	54.08
29.3	12.473 132	73.86 168	59.75 28	58.51 163	5.938 156	51.88 180	45.918 274	56.05 197
Aug. 8.3	12.310 163	75.20 124	59.39 36	59.77 126	5.749 189	53.30 142	45.601 317	57.59 154
18.3	12.122 188	76.17 97	58.95 44	60.63 86	5.532 217	54.31 101	45.249 352	58.65 106
28.3	11.914 208	76.75 58	58.48 47	61.03 40	5.295 237	54.89 58	44.872 377	59.22 57
	219	17	50	7	248	13	392	7
Sept. 7.2	11.695	76.92	57.98	60.96	5.047	55.02	44.480	59.29
17.2	11.473 222	76.67 25	57.48 50	60.41 55	4.795 252	54.70 32	44.085 395	58.84 45
27.2	11.259 214	76.01 66	56.99 49	59.38 103	4.550 245	53.92 78	43.700 385	57.87 97
Oct. 7.2	11.060 199	74.94 107	56.56 43	57.92 146	4.323 227	52.70 122	43.339 361	56.41 146
17.1	10.888 172	73.47 147	56.19 37	56.05 187	4.124 199	51.05 165	43.013 326	54.47 194
	136	183	28	220	162	206	278	237
27.1	10.752	71.64	55.91	53.85	3.962	48.99	42.735	52.10
Nov. 6.1	10.657 95	69.45 219	55.74 17	51.42 243	3.847 115	46.57 242	42.516 219	49.32 278
16.0	10.614 43	66.96 249	55.68 6	48.82 260	3.784 63	43.83 274	42.367 149	46.20 312
26.0	10.624 10	64.21 275	55.76 8	46.17 265	3.777 7	40.82 301	42.293 74	42.82 338
Dec. 6.0	10.688 64	61.29 292	55.96 20	43.57 260	3.831 54	37.64 318	42.299 6	39.26 356
	119	303	33	246	112	328	87	363
16.0	10.807	58.26	56.29	41.11	3.943	34.36	42.386	35.63
25.9	10.977 170	55.22 304	56.73 44	38.88 223	4.111 168	31.09 327	42.552 166	32.05 358
35.9	11.193 216	52.28 294	57.28 55	36.93 195	4.329 218	27.93 316	42.791 239	28.62 343
Mean Place	9.418	68.88	51.756	37.47	2.984	45.77	43.346	47.51
Sec δ, Tan δ	1.176	+0.619	2.775	-2.589	1.288	+0.812	1.833	+1.536
Dψ α, Dω α	+0.05	+0.01	+0.13	-0.06	+0.04	+0.02	+0.02	+0.03
Dψ δ, Dω δ	-0.1	-0.9	-0.1	-0.9	-0.1	-0.9	-0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Scorpii. Mag. 2.4		ζ Herculis. Mag. 6.4		ϵ^1 Aras. Mag. 4.2		κ Ophiuchi. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 44	° ' " -34 8	h m 16 48	° ' " +15 6	h m 16 52	° ' " -53 1	h m 16 53	° ' " + 9 29
Jan. 0.9	46.842	38.20	17.752	36.52	57.231	62.11	44.031	63.90
10.9	47.142 300	38.09 11	17.984 232	34.21 231	57.611 380	60.96 115	44.261 280	61.84 206
20.9	47.473 331	38.16 7	18.247 263	32.06 215	58.036 425	60.08 88	44.520 259	59.89 196
30.8	47.827 354	38.40 24	18.530 283	30.14 192	58.496 460	59.51 57	44.799 279	58.14 175
Feb. 9.8	48.193 366	38.77 37	18.828 298	28.54 160	58.978 483	59.24 27	45.093 294	56.64 150
	371	49	305	123	494	0	301	117
19.8	48.564	39.26	19.133	27.31	59.472	59.24	45.394	55.47
Mar. 1.8	48.935 371	39.84 53	19.437 304	26.49 82	59.968 496	59.52 23	45.695 301	54.66 81
11.7	49.299 364	40.48 64	19.738 301	26.12 37	60.468 490	60.06 53	45.993 298	54.24 42
21.7	49.650 351	41.17 69	20.028 290	26.19 7	60.935 477	60.83 78	46.282 289	54.22 2
31.7	49.986 336	41.88 71	20.304 276	26.69 50	61.393 458	61.81 98	46.558 276	54.59 37
	317	74	258	90	432	117	259	73
Apr. 10.7	50.303	42.62	20.562	27.59	61.825	62.96	46.817	55.32
20.6	50.597 294	43.36 74	20.800 238	28.85 126	62.227 402	64.31 133	47.067 240	56.38 106
30.6	50.865 268	44.12 76	21.013 213	30.40 155	62.593 366	65.80 149	47.275 218	57.69 131
May 10.6	51.105 240	44.88 76	21.200 187	32.16 176	62.920 327	67.40 160	47.468 193	59.20 151
20.5	51.312 207	45.64 76	21.358 158	34.08 192	63.199 279	69.08 168	47.632 164	60.88 166
	170	77	126	201	228	174	135	175
30.5	51.482 131	46.41 75	21.483 92	36.09 204	63.427 174	70.82 176	47.767 101	62.63 177
June 9.5	51.613 90	47.16 72	21.575 56	38.13 199	63.601 116	72.58 173	47.868 66	64.40 175
19.5	51.703 46	47.88 67	21.631 19	40.12 190	63.717 54	74.31 166	47.934 29	66.15 166
29.4	51.749 1	48.55 62	21.650 18	42.02 177	63.771 8	75.97 157	47.963 7	67.81 156
July 9.4	51.750 42	49.17 54	21.632 53	43.79 157	63.763 68	77.54 140	47.956 42	69.37 140
19.4	51.708	49.71	21.579	45.36	63.695	78.94	47.914	70.77
29.4	51.623 85	50.14 28	21.492 87	46.73 137	63.569 126	80.11 117	47.836 78	71.99 122
Aug. 8.3	51.501 122	50.42 12	21.373 119	47.85 112	63.391 178	81.05 94	47.727 109	73.01 102
18.3	51.347 154	50.54 4	21.229 144	48.72 87	63.168 223	81.68 63	47.592 135	73.82 81
28.3	51.168 179	50.50 23	21.063 166	49.30 58	62.911 257	81.99 31	47.434 158	74.39 57
	194	23	178	30	278	3	171	32
Sept. 7.2	50.974	50.28	20.885	49.60	62.633	81.96	47.263	74.71
17.2	50.776 198	49.88 40	20.703 182	49.61 1	62.348 285	81.56 40	47.087 176	74.80 9
27.2	50.584 192	49.31 57	20.525 178	49.30 31	62.070 278	80.81 75	46.915 172	74.62 18
Oct. 7.2	50.411 173	48.59 72	20.361 164	48.70 60	61.815 255	79.73 108	46.756 159	74.19 43
17.1	50.267 144	47.76 83	20.219 142	47.80 90	61.599 216	78.37 126	46.618 138	73.49 70
	103	91	108	121	163	161	106	96
27.1	50.164	46.85	20.111	46.59	61.436	76.76	46.512	72.53
Nov. 6.1	50.110 54	46.91 94	20.042 69	45.11 148	61.338 98	74.98 178	46.444 68	71.31 122
16.1	50.112 2	44.99 92	20.017 25	43.35 176	61.311 27	73.09 189	46.421 23	69.85 146
26.0	50.172 60	44.14 85	20.041 24	41.37 198	61.363 132	71.17 192	46.445 24	68.17 168
Dec. 6.0	50.291 119	43.41 73	20.115 74	39.19 218	61.495 152	69.31 186	46.518 73	66.31 186
	175	60	123	230	208	121	121	200
16.0	50.466	42.81	20.238	36.89	61.703	67.57	46.639	64.31
25.9	50.694 228	42.39 42	20.405 167	34.53 236	61.984 281	66.01 156	46.806 166	62.24 207
35.9	50.967 273	42.15 24	20.614 209	32.18 235	62.327 343	64.67 134	47.011 206	60.15 209
Mean Place	47.028	37.71	18.083	45.09	57.748	63.96	44.315	71.40
Sec δ , Tan δ	1.208	-0.678	1.036	+0.270	1.663	-1.329	1.014	+0.168
$D\psi\alpha$, $D_\alpha\alpha$	+0.08	-0.01	+0.05	+0.01	+0.09	-0.03	+0.06	0.00
$D\psi\delta$, $D_\alpha\delta$	-0.1	-0.9	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Ophiuchi. Mag. 5.0		ε Herculis. Mag. 3.9		δ Herculis. Mag. 5.3		γ Ophiuchi. Mag. 2.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 56	° ' " - 4 5	h m 16 57	° ' " +31 2	h m 16 58	° ' " +33 40	h m 17 5	° ' " -15 37
Jan. 0.9	40.810	61.88	6.161	42.05	31.699	65.03	36.776	26.73
10.9	41.047 ²³⁷	63.29 ¹⁴¹	6.387 ²²⁶	39.19 ²⁸⁶	31.925 ²²⁶	62.09 ²⁹⁴	37.020 ²⁴⁴	27.49 ⁷⁶
20.9	41.313	64.67 ¹³⁸	6.649 ²⁶²	36.56 ²⁶³	32.188 ²⁶³	59.40 ²⁶⁰	37.293 ²⁷³	28.29 ⁸⁰
30.8	41.598 ²⁸⁵	65.97 ¹³⁰	6.938 ²⁸⁹	34.24 ²⁸⁹	32.481 ²⁶⁸	57.03 ²⁸⁷	37.588 ²⁹⁵	29.09 ⁸⁰
Feb. 9.8	41.896 ²⁹⁸	67.11 ¹¹⁴	7.248 ³¹⁰	32.35 ¹⁸⁹	32.796 ³¹⁵	55.10 ¹⁹⁸	37.898 ³¹⁰	29.86 ⁷⁷
19.8	42.203	68.08	7.569	30.96	33.122	53.66	38.215	30.54
Mar. 1.8	42.509 ³⁰⁶	68.81 ⁷³	7.895 ³²⁶	30.08 ⁸⁸	33.453 ³³¹	52.78 ⁸⁸	38.534 ³¹⁹	31.12 ⁵⁸
11.7	42.810 ³⁰¹	69.29 ⁴⁸	8.218 ³²³	29.77 ³¹	33.783 ³³⁰	52.48 ³⁰	38.850 ³¹⁶	31.57 ⁴⁵
21.7	43.104 ²⁹⁴	69.49 ²⁰	8.531 ³¹³	30.03 ²⁶	34.104 ³²¹	52.76 ²⁸	39.160 ³¹⁰	31.85 ²⁸
31.7	43.385 ²⁸¹	69.43 ⁶	8.830 ²⁹⁹	30.83 ⁸⁰	34.408 ³⁰⁴	53.59 ⁸⁸	39.457 ²⁹⁷	31.99 ¹⁴
Apr. 10.7	43.652	69.11	9.110	32.13	34.694	54.93	39.742	31.99
20.6	43.901 ²⁴⁹	68.58 ⁵³	9.364 ²⁵⁴	33.87 ¹⁷⁴	34.954 ²⁶⁰	56.73 ¹⁸⁰	40.010 ²⁶⁸	31.86 ¹³
30.6	44.129 ²²⁸	67.86 ⁷²	9.592 ²²⁸	35.98 ²¹¹	35.185 ²³¹	58.92 ²¹⁹	40.257 ²⁴⁷	31.61 ²⁵
May 10.6	44.332 ²⁰³	66.99 ⁸⁷	9.788 ¹⁹⁶	38.36 ²³⁸	35.383 ¹⁹⁸	61.39 ²⁴⁷	40.482 ²²⁵	31.29 ³²
20.5	44.509 ¹⁷⁷	66.02 ⁹⁷	9.949 ¹⁶¹	40.95 ²⁵⁹	35.545 ¹⁶²	64.06 ²⁶⁷	40.679 ¹⁹⁷	30.91 ³⁸
30.5	44.657 ¹⁴⁸	64.99 ¹⁰⁸	10.073 ¹²⁴	43.65 ²⁷⁰	35.669 ¹²⁴	66.85 ²⁷⁹	40.846 ¹⁶⁷	30.50 ⁴¹
June 9.5	44.772 ¹¹⁵	63.93 ¹⁰⁶	10.158 ⁸⁵	46.37 ²⁷²	35.753 ⁸⁴	69.66 ²⁸¹	40.981 ¹³⁵	30.08 ⁴²
19.5	44.852 ⁸⁰	62.88 ¹⁰⁵	10.203 ⁴⁵	49.04 ²⁶⁷	35.794 ⁴¹	72.43 ²⁷⁷	41.080 ⁹⁹	29.66 ⁴²
29.4	44.898 ⁴⁶	61.88 ¹⁰⁰	10.205 ²	51.57 ²⁵³	35.793 ¹	75.06 ²⁶⁸	41.140 ⁶⁰	29.27 ³⁹
July 9.4	44.906 ⁸	60.94 ⁹⁴	10.166 ³⁹	53.93 ²³⁶	35.749 ⁴⁴	77.50 ²⁴⁴	41.161 ²¹	28.91 ³⁶
19.4	44.877 ²⁹	60.09	10.087	56.04	35.664	79.67	41.143	28.57
29.4	44.813 ⁶⁴	59.33 ⁷⁶	9.970 ¹¹⁷	57.86 ¹⁸²	35.540 ¹²⁴	81.56 ¹⁸⁹	41.087 ⁵⁶	28.26 ³¹
Aug. 8.3	44.717 ⁹⁶	58.69 ⁶⁴	9.819 ¹⁵¹	59.34 ¹⁴⁸	35.382 ¹⁵⁸	83.10 ¹⁵⁴	40.995 ⁹²	27.98 ²⁸
18.3	44.593 ¹²⁴	58.15 ⁵⁴	9.640 ¹⁷⁹	60.47 ¹¹³	35.195 ¹⁸⁷	84.26 ¹¹⁶	40.874 ¹²¹	27.71 ²⁷
28.3	44.447 ¹⁴⁶	57.72 ⁴³	9.438 ²⁰²	61.21 ⁷⁴	34.983 ²¹²	85.02 ⁷⁶	40.729 ¹⁴⁵	27.46 ²⁵
Sept. 7.2	44.285	57.41	9.221	61.55	34.758	85.36	40.565	27.22
17.2	44.118 ¹⁶⁷	57.24 ¹⁷	8.998 ²²³	61.48 ⁷	34.526 ²³²	85.29 ⁷	40.394 ¹⁷¹	26.99 ²³
27.2	43.955 ¹⁶³	57.19 ⁵	8.779 ²¹⁹	61.01 ⁴⁷	34.297 ²²⁹	84.79 ⁵⁰	40.225 ¹⁶⁹	26.77 ²³
Oct. 7.2	43.803 ¹⁵²	57.28 ⁹	8.575 ²⁰⁴	60.12 ⁸⁹	34.083 ²¹⁴	83.86 ⁹⁸	40.069 ¹⁵⁶	26.58 ¹⁹
17.1	43.674 ¹²⁹	57.53 ²⁵	8.393 ¹⁸²	58.82 ¹³⁰	33.891 ¹⁹²	82.51 ¹³⁵	39.934 ¹³⁵	26.44 ¹⁴
27.1	43.576 ⁹⁸	57.93 ⁴⁰	8.244 ¹⁴⁹	57.13 ¹⁶⁹	33.733 ¹⁵⁸	80.76 ¹⁷⁵	39.831 ¹⁰⁸	26.35 ⁹
Nov. 6.1	43.518 ⁵⁸	58.50 ⁵⁷	8.135 ¹⁰⁹	55.09 ²⁰⁴	33.616 ¹¹⁷	78.64 ²¹²	39.768 ⁶³	26.34 ¹
16.1	43.503 ¹⁵	59.25 ⁷⁵	8.074 ⁶¹	52.73 ²³⁶	33.547 ⁶⁰	76.19 ²⁴⁵	39.751 ¹⁷	26.44 ¹⁰
26.0	43.536 ³³	60.16 ⁹¹	8.066 ⁸	50.09 ²⁶⁴	33.531 ¹⁶	73.47 ²⁷²	39.782 ³¹	26.67 ²³
Dec. 6.0	43.619 ⁸³	61.24 ¹⁰⁸	8.112 ⁴⁶	47.25 ²⁸⁴	33.570 ³⁹	70.54 ²⁹³	39.865 ⁸³	27.02 ³⁵
16.0	43.749	62.47	8.211	44.28	33.665	67.48	39.997	27.50
25.9	43.923 ¹⁷⁴	63.79 ¹³²	8.361 ¹⁸⁰	41.27 ³⁰¹	33.813 ¹⁴⁸	64.39 ³⁰⁹	40.176 ¹⁷⁹	28.10 ⁶⁰
35.9	44.137 ²¹⁴	65.17 ¹³⁸	8.558 ¹⁹⁷	38.33 ²⁹⁴	34.009 ¹⁹⁸	61.37 ³⁰²	40.395 ²¹⁹	28.79 ⁶⁰
Mean Place	40.999	56.57	6.805	52.31	32.416	75.49	36.950	23.24
Sec δ, Tan δ	1.003	-0.072	1.167	+0.602	1.202	+0.667	1.039	-0.280
D♂ α, D♂ α	+0.06	0.00	+0.05	+0.01	+0.04	+0.01	+0.07	0.00
D♂ δ, D♂ δ	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Scorpii. Mag. 3.4		ζ Draconis. Mag. 3.2		α Herculis. Var. 3.1-3.9		δ Herculis. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 6	° ' " -43 7	h m 17 8	° ' " +65 48	h m 17 10	° ' " +14 28	h m 17 11	° ' " +24 55
Jan. 0.9	11.984	51.94	29.73	48.32	51.342	54.99	36.736	61.96
10.9	12.296 ³¹²	51.19	30.00 ²⁷	44.92 ³⁴⁰	51.555 ²¹³	52.74 ²²⁵	36.947 ²¹¹	59.28 ²⁶⁸
20.9	12.647 ³⁵¹	50.64	30.37 ³⁷	41.83 ³⁰⁹	51.800 ²⁴⁵	50.62 ²¹²	37.192 ²⁴⁵	56.79 ²⁴⁹
30.9	13.026 ³⁷⁹	50.30	30.82 ⁴⁵	39.16 ²⁶⁷	52.070 ²⁷⁰	48.71 ¹⁹¹	37.465 ²⁷³	54.58 ²²¹
Feb. 9.8	13.427 ⁴⁰¹	50.17 ¹³	31.33 ⁵¹	37.00 ²¹⁶	52.356 ²⁸⁶	47.09 ¹⁶²	37.758 ²⁹³	52.72 ¹⁸⁶
19.8	13.838 ⁴¹¹	50.23 ⁶	31.88 ⁵⁵	35.44 ¹⁵⁶	52.653 ²⁹⁷	45.83 ¹²⁶	38.064 ³⁰⁶	51.30 ¹⁴²
Mar. 1.8	14.253 ⁴¹⁵	50.47 ²⁴	32.45 ⁵⁷	34.54 ⁹⁰	52.955 ³⁰²	44.97 ⁸⁶	38.376 ³¹²	50.38 ⁹²
11.7	14.665 ⁴¹²	50.86 ³⁹	33.03 ⁵⁸	34.32 ²³	53.255 ³⁰⁰	44.55 ⁴²	38.687 ³¹¹	49.96 ⁴²
21.7	15.069 ⁴⁰⁴	51.39 ⁵⁷	33.60 ⁵⁷	34.78 ⁴⁶	53.550 ²⁹⁵	44.56 ¹	38.992 ³⁰⁵	50.07 ¹¹
31.7	15.459 ³⁹⁰	52.06 ⁶³	34.14 ⁵⁴	35.89 ¹¹¹	53.834 ²⁸⁴	45.01 ⁴⁵	39.286 ²⁹⁴	50.69 ⁶²
Apr. 10.7	15.831 ³⁷²	52.84 ⁷⁸	34.64 ⁵⁰	37.60 ¹⁷¹	54.104 ²⁷⁰	45.87 ⁸⁶	39.565 ²⁷⁹	51.78 ¹⁰⁹
20.6	16.180 ³⁴⁹	53.71 ⁸⁷	35.08 ⁴⁴	39.84 ²²⁴	54.356 ²⁶²	47.09 ¹²²	39.823 ²⁶⁸	53.30 ¹⁵²
30.6	16.503 ³²⁸	54.67 ⁹⁶	35.45 ³⁷	42.52 ²⁶⁸	54.587 ²³¹	48.60 ¹⁵¹	40.058 ²³⁵	55.17 ¹⁸⁷
May 10.6	16.794 ²⁹¹	55.72 ¹⁰⁵	35.75 ³⁰	45.54 ³⁰²	54.792 ²⁰⁵	50.36 ¹⁷⁶	40.266 ²⁰⁸	57.33 ²¹⁶
20.6	17.049 ²⁵⁵	56.84 ¹¹²	35.97 ²²	48.79 ³²⁵	54.971 ¹⁷⁹	52.29 ¹⁹³	40.442 ¹⁷⁶	59.69 ²³⁶
30.5	17.264 ²¹⁵	58.00 ¹¹⁶	36.10 ¹³	52.18 ³³⁹	55.118 ¹⁴⁷	54.33 ²⁰⁴	40.584 ¹⁴²	62.17 ²⁴⁸
June 9.5	17.435 ¹⁷¹	59.19 ¹¹⁹	36.14 ⁴	55.59 ³⁴¹	55.231 ¹¹³	56.40 ²⁰⁷	40.690 ¹⁰⁶	64.70 ²⁵³
19.5	17.559 ¹²⁴	60.39 ¹²⁰	36.09 ⁵	58.94 ³³⁵	55.308 ⁷⁷	58.45 ²⁰⁵	40.756 ⁶⁶	67.19 ²⁴⁹
29.4	17.631 ⁷²	61.54 ¹¹⁵	35.95 ¹⁴	62.13 ³¹⁹	55.348 ⁴⁰	60.42 ¹⁹⁷	40.783 ²⁷	69.59 ²⁴⁰
July 9.4	17.653 ²²	62.65 ¹¹¹	35.74 ²¹	65.07 ²⁹⁴	55.350 ²	62.26 ¹⁸⁴	40.769 ¹⁴	71.83 ²²⁴
19.4	17.622 ⁸¹	63.66 ¹⁰¹	35.44 ³⁰	67.70 ²⁶³	55.314 ³⁶	63.92 ¹⁶⁶	40.716 ⁵³	73.86 ²⁰⁸
29.4	17.540 ⁸³	64.54 ⁸⁸	35.07 ³⁷	69.96 ²²⁶	55.240 ⁷⁴	65.39 ¹⁴⁷	40.625 ⁹¹	75.63 ¹⁷⁷
Aug. 8.3	17.413 ¹²⁷	65.23 ⁶⁹	34.64 ⁴³	71.80 ¹⁸⁴	55.133 ¹⁰⁷	66.62 ¹²³	40.498 ¹²⁷	77.12 ¹⁴⁹
18.3	17.246 ¹⁶⁷	65.73 ⁵⁹	34.15 ⁴⁹	73.18 ¹³⁸	54.998 ¹³⁵	67.60 ⁹⁸	40.342 ¹⁵⁶	78.28 ¹¹⁶
28.3	17.048 ¹⁹⁶	65.98 ²⁵	33.62 ⁵³	74.06 ⁸⁸	54.838 ¹⁸⁰	68.30 ⁷⁰	40.162 ¹⁸⁰	79.10 ⁸²
Sept. 7.3	16.827 ²²¹	65.99 ¹	33.07 ⁵⁵	74.44 ³⁸	54.663 ¹⁷⁵	68.74 ⁴⁴	39.965 ¹⁹⁷	79.57 ⁴⁷
17.2	16.597 ²³⁰	65.73 ²⁶	32.52 ⁵⁵	74.29 ¹⁵	54.479 ¹⁸⁴	68.87 ¹³	39.759 ²⁰⁶	79.66 ⁹
27.2	16.370 ²³⁷	65.22 ⁵¹	31.97 ⁵⁵	73.62 ⁹⁷	54.296 ¹⁸³	68.70 ¹⁷	39.555 ²⁰⁴	79.37 ²⁹
Oct. 7.2	16.160 ²¹⁰	64.45 ⁷⁷	31.44 ⁵³	72.43 ¹¹⁹	54.124 ¹⁷²	68.24 ⁴⁶	39.361 ¹⁹⁴	78.70 ⁶⁷
17.1	15.979 ¹⁸¹	63.47 ⁹⁸	30.94 ⁵⁰	70.73 ¹⁷⁰	53.971 ¹⁵³	67.47 ⁷⁷	39.188 ¹⁷³	77.67 ¹⁰³
27.1	15.838 ¹⁴¹	62.30 ¹¹⁷	30.50 ⁴⁴	68.56 ²¹⁷	53.848 ¹²³	66.40 ¹⁰⁷	39.044 ¹⁴⁴	76.28 ¹³⁹
Nov. 6.1	15.750 ⁸⁸	61.02 ¹²⁸	30.13 ³⁷	65.97 ²⁵⁹	53.761 ⁸⁷	65.06 ¹³⁴	38.938 ¹⁰⁶	74.53 ¹⁷⁵
16.1	15.721 ²⁹	59.65 ¹³⁷	29.84 ²⁹	62.99 ²⁹⁸	53.717 ⁴⁴	63.43 ¹⁶³	38.876 ⁶²	72.47 ²⁰⁶
26.0	15.756 ³⁵	58.27 ¹³⁸	29.64 ²⁰	59.71 ³²⁸	53.720 ³	61.58 ¹⁸⁵	38.864 ¹²	70.15 ²³²
Dec. 6.0	15.859 ¹⁰⁸	56.95 ¹³²	29.55 ⁹	56.20 ³⁵¹	53.772 ⁵²	59.51 ²⁰⁷	38.902 ⁸⁸	67.60 ²⁵⁶
16.0	16.026 ¹⁶⁷	55.73 ¹²²	29.56 ¹	52.58 ³⁶²	53.872 ¹⁰⁰	57.31 ²²⁰	38.991 ⁸⁹	64.91 ²⁶⁹
26.0	16.252 ²²⁶	54.66 ¹⁰⁷	29.68 ¹²	48.94 ³⁶⁴	54.019 ¹⁴⁷	55.03 ²²⁸	39.130 ¹³⁹	62.16 ²⁷⁵
35.9	16.533 ²⁸¹	53.76 ⁹⁰	29.90 ²²	45.43 ³⁵¹	54.206 ¹⁸⁷	52.75 ²²⁸	39.312 ¹⁸²	59.43 ²⁷³
Mean Place	12.319	52.14	32.643	60.27	51.730	62.46	37.296	70.61
Sec δ , Tan δ	1.370	-0.937	2.441	+2.227	1.033	+0.258	1.103	+0.465
$D\psi\alpha$, $D_\omega\alpha$	+0.09	-0.01	0.00	+0.03	+0.05	0.00	+0.05	+0.01
$D\psi\delta$, $D_\omega\delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Herculis. Mag. 3.4		θ Ophiuchi. Mag. 3.4		ω Herculis. Mag. 5.4		β Arse. Mag. 2.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 12	° ' " +36 53	h m 17 16	° ' " -24 55	h m 17 17	° ' " +32 34	h m 17 18	° ' " -55 27
Jan. 0.9	8.457	57.33	54.416	6.40	32.412	16.26	23.168	8.73
10.9	8.668	54.29	54.666	6.57	32.618	13.31	23.531	7.23
20.9	8.922	51.47	54.947	6.84	32.863	10.56	23.948	5.98
30.9	9.208	49.00	55.254	7.18	33.138	8.12	24.407	5.00
Feb. 9.8	9.521	46.95	55.577	7.56	33.439	6.08	24.896	4.32
19.8	9.850	45.40	55.910	7.95	33.755	4.52	25.404	3.92
Mar. 1.8	10.188	44.43	56.247	8.33	34.081	3.49	25.922	3.81
11.8	10.526	44.05	56.584	8.67	34.408	3.04	26.441	3.97
21.7	10.859	44.26	56.915	8.97	34.730	3.15	26.954	4.39
31.7	11.179	45.05	57.237	9.20	35.040	3.82	27.452	5.07
Apr. 10.7	11.479	46.39	57.545	9.38	35.334	5.01	27.928	5.96
20.6	11.756	48.20	57.837	9.52	35.607	6.67	28.379	7.07
30.6	12.004	50.42	58.110	9.63	35.854	8.73	28.796	8.37
May 10.6	12.219	52.97	58.359	9.71	36.070	11.10	29.173	9.83
20.6	12.397	55.74	58.580	9.79	36.253	13.71	29.504	11.44
30.5	12.536	58.64	58.771	9.86	36.399	16.45	29.782	13.15
June 9.5	12.631	61.59	58.926	9.96	36.504	19.25	30.003	14.94
19.5	12.682	64.51	59.043	10.07	36.567	22.03	30.162	16.75
29.5	12.688	67.31	59.119	10.19	36.587	24.70	30.254	18.55
July 9.4	12.648	69.91	59.153	10.32	36.564	27.19	30.279	20.28
19.4	12.564	72.27	59.144	10.45	36.498	29.46	30.236	21.87
29.4	12.439	74.33	59.094	10.56	36.392	31.44	30.128	23.30
Aug. 8.3	12.276	76.04	59.005	10.63	36.250	33.10	29.960	24.49
18.3	12.082	77.36	58.881	10.65	36.074	34.39	29.739	25.41
28.3	11.861	78.29	58.730	10.61	35.873	35.31	29.476	26.01
Sept. 7.3	11.623	78.78	58.558	10.50	35.653	35.82	29.184	26.25
17.2	11.376	78.83	58.377	10.30	35.424	35.91	28.875	26.12
27.2	11.130	78.43	58.196	10.01	35.194	35.57	28.569	25.62
Oct. 7.2	10.896	77.58	58.026	9.66	34.976	34.81	28.278	24.75
17.2	10.684	76.30	57.877	9.26	34.777	33.63	28.023	23.54
27.1	10.504	74.59	57.761	8.83	34.609	32.04	27.817	22.03
Nov. 6.1	10.364	72.48	57.686	8.40	34.479	30.08	27.674	20.29
16.1	10.272	70.03	57.659	8.00	34.394	27.78	27.603	18.38
26.0	10.234	67.28	57.683	7.66	34.360	25.17	27.613	16.37
Dec. 6.0	10.252	64.30	57.760	7.42	34.380	22.34	27.705	14.35
16.0	10.326	61.17	57.890	7.28	34.455	19.35	27.879	12.39
26.0	10.456	57.99	58.069	7.26	34.582	16.30	28.129	10.55
35.9	10.637	54.87	58.291	7.35	34.756	13.28	28.448	8.89
Mean Place	9.316	67.14	54.620	4.13	33.166	25.28	23.824	9.79
Sec δ , Tan δ	1.250	+0.751	1.103	-0.465	1.187	+0.639	1.763	-1.453
$D\phi\alpha$, $D\omega\alpha$	+0.04	+0.01	+0.07	-0.01	+0.04	+0.01	+0.10	-0.02
$D\phi\delta$, $D\omega\delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

APPARENT PLACES OF STARS, 1917.

455

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 4.3		σ Ophiuchi. Mag. 4.4		δ Arct. Mag. 3.8		α Arct. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 21	° ' " -24 6	h m 17 22	° ' " + 4 12	h m 17 23	° ' " -60 36	h m 17 25	° ' " -49 48
	s	"	s	"	s	"	s	"
Jan. 0.9	17.738	3.09	23.449	36.12	35.15	57.78	24.871	41.95
10.9	17.982 ²⁴⁴	3.29	23.650 ²¹⁰	34.37 ¹⁷⁵	35.54 ³⁹	55.98 ¹⁸⁰	25.190 ³¹⁹	40.68 ¹²⁷
20.9	18.258 ²⁷⁶	3.57	23.898 ²³⁹	32.70 ¹⁶⁷	36.01 ⁴⁷	54.45 ¹⁵³	25.557 ³⁶⁷	39.62 ¹⁰⁶
30.9	18.560 ³⁰²	3.91	24.162 ²⁶⁴	31.16 ¹⁵⁴	36.52 ⁵¹	53.22 ¹²⁹	25.962 ⁴⁰⁵	38.79 ⁸³
Feb. 9.8	18.879 ³¹⁹	4.29	24.443 ²⁸¹	29.82 ¹³⁴	37.07 ⁵⁵	52.30 ⁹²	26.393 ⁴³¹	38.21 ⁵⁸
19.8	18.879 ³³⁰	4.29	24.443 ²⁹²	29.82 ¹⁰⁶	37.07 ⁵⁸	52.30 ⁵⁸	26.393 ⁴⁵⁰	38.21 ³⁵
Mar. 1.8	19.209 ³³⁴	4.67	24.735 ²⁹⁸	28.76 ⁷⁶	37.65 ⁵⁹	51.72 ²⁷	26.843 ⁴⁵⁸	37.86 ¹²
11.8	19.543 ³³⁴	5.03	25.033 ²⁹⁸	28.00 ⁴³	38.24 ⁵⁹	51.45 ⁵	27.301 ⁴⁶¹	37.74 ¹⁰
21.7	19.877 ³³⁰	5.34	25.331 ²⁹⁶	27.57 ⁸	38.83 ⁵⁸	51.50 ³⁶	27.762 ⁴⁵⁶	37.84 ³²
31.7	20.207 ³²¹	5.59	25.626 ²⁸⁶	27.49 ²⁷	39.41 ⁵⁷	51.86 ⁶⁸	28.218 ⁴⁴⁵	38.16 ⁵¹
	20.528 ³⁰⁸	5.79	25.912 ²⁷⁴	27.76 ⁶⁰	39.98 ⁵⁸	52.51 ⁹⁴	28.663 ⁴²⁹	38.67 ⁷⁰
Apr. 10.7	20.836 ²⁹⁸	5.93	26.186 ²⁵⁸	28.36 ⁸⁸	40.53 ⁵²	53.45 ¹¹⁹	29.092 ⁴⁰⁶	39.37 ⁸⁶
20.6	21.129 ²⁷⁴	6.01	26.444 ²⁴¹	29.24 ¹¹⁴	41.05 ⁴⁸	54.64 ¹⁴⁰	29.498 ³⁸⁰	40.23 ¹⁰²
30.6	21.403 ²⁵⁰	6.05	26.685 ²¹⁷	30.38 ¹³⁸	41.53 ⁴³	56.04 ¹⁶²	29.878 ³⁴⁵	41.25 ¹¹⁸
May 10.6	21.653 ²²³	6.07	26.902 ¹⁹⁴	31.71 ¹⁴⁷	41.96 ³⁸	57.66 ¹⁷⁹	30.223 ³⁰⁷	42.43 ¹²⁹
20.6	21.876 ¹⁹⁴	6.08	27.096 ¹⁶⁴	33.18 ¹⁵⁶	42.34 ³²	59.45 ¹⁹²	30.530 ²⁶²	43.72 ¹³⁹
30.5	22.070 ¹⁵⁸	6.10	27.260 ¹³¹	34.74 ¹⁵⁹	42.66 ²⁶	61.37 ²⁰¹	30.792 ²¹²	45.11 ¹⁴⁷
June 9.5	22.228 ¹²⁰	6.12	27.391 ⁹⁹	36.33 ¹⁵⁷	42.92 ¹⁸	63.38 ²⁰⁵	31.004 ¹⁵⁸	46.58 ¹⁵¹
19.5	22.348 ⁸⁰	6.17	27.490 ⁶⁰	37.90 ¹⁵²	43.10 ¹⁰	65.43 ²⁰⁴	31.162 ¹⁰⁰	48.09 ¹⁵⁰
29.5	22.428 ³⁸	6.24	27.550 ²²	39.42 ¹⁴²	43.20 ²	67.47 ¹⁹⁸	31.262 ³⁹	49.59 ¹⁴⁶
July 9.4	22.466 ⁵	6.32	27.572 ¹⁶	40.84 ¹³⁰	43.22 ⁵	69.45 ¹⁸⁵	31.301 ²¹	51.05 ¹³⁷
19.4	22.461 ⁴⁶	6.40	27.556 ⁵⁴	42.14 ¹¹⁴	43.17 ¹³	71.30 ¹⁶⁵	31.280 ⁷⁹	52.42 ¹²²
29.4	22.415 ⁸⁵	6.48	27.502 ⁸⁷	43.28 ⁹⁸	43.04 ¹⁹	72.95 ¹⁴⁰	31.201 ¹³³	53.64 ¹⁰⁵
Aug. 8.3	22.330 ¹²⁰	6.54	27.415 ¹¹⁹	44.26 ⁸⁰	42.85 ²⁶	74.35 ¹¹⁰	31.068 ¹⁸²	54.69 ⁸¹
18.3	22.210 ¹⁴⁸	6.55	27.296 ¹⁴³	45.06 ⁵⁹	42.59 ³¹	75.45 ⁷⁵	30.886 ²²²	55.50 ⁵⁵
28.3	22.062 ¹⁷⁰	6.52	27.153 ¹⁶³	45.65 ⁴¹	42.28 ³⁴	76.20 ³⁶	30.664 ²⁵¹	56.05 ²⁵
Sept. 7.3	21.892 ¹⁸⁰	6.42	26.990 ¹⁷²	46.06 ²⁰	41.94 ³⁷	76.56 ⁵	30.413 ²⁶⁵	56.30 ⁷
17.2	21.712 ¹⁸¹	6.24	26.818 ¹⁷³	46.26 ¹	41.57 ³⁷	76.51 ⁴⁶	30.148 ²⁶⁷	56.23 ⁴¹
27.2	21.531 ¹⁷⁰	6.00	26.645 ¹⁶⁴	46.25 ²⁸	41.20 ³⁴	76.05 ⁸⁹	29.881 ²⁵³	55.82 ⁷²
Oct. 7.2	21.361 ¹⁸⁰	5.68	26.481 ¹⁴⁷	46.02 ⁴⁴	40.86 ³⁰	75.16 ¹²⁶	29.628 ²²⁵	55.10 ¹⁰¹
17.2	21.211 ¹¹⁸	5.32	26.334 ¹¹⁹	45.58 ⁶⁷	40.56 ²⁶	73.90 ¹⁶¹	29.403 ¹⁸³	54.09 ¹²⁸
27.1	21.093 ⁷⁸	4.94	26.215 ⁸⁴	44.91 ⁸⁸	40.30 ¹⁸	72.29 ¹⁸⁹	29.220 ¹²⁸	52.81 ¹⁴⁸
Nov. 6.1	21.015 ⁸²	4.56	26.131 ⁴²	44.03 ¹¹⁰	40.12 ¹⁰	70.40 ²¹¹	29.092 ⁶⁵	51.33 ¹⁶³
16.1	20.983 ¹⁹	4.21	26.089 ⁴	42.93 ¹²⁹	40.02 ²	68.29 ²²⁴	29.027 ⁶	49.70 ¹⁷¹
26.0	21.002 ⁷²	3.92	26.093 ⁵⁰	41.64 ¹⁶³	40.00 ¹⁹	66.05 ²²⁴	29.033 ¹⁵¹	47.99 ¹⁷³
Dec. 6.0	21.074 ¹²⁴	3.72	26.143 ⁹⁹	40.17 ¹⁷⁵	40.08 ³⁵	63.77 ¹⁹⁵	29.111 ²⁸²	46.26 ¹⁶⁶
16.0	21.198 ¹⁷⁸	3.62	26.242 ¹⁴²	38.54 ¹⁷⁰	40.27 ²⁶	61.53 ²¹²	29.262 ²¹⁹	44.60 ¹⁵⁶
26.0	21.371 ²¹⁷	3.63	26.384 ¹⁸⁴	36.84 ¹⁷⁵	40.53 ³⁵	59.41 ¹⁹⁵	29.481 ²⁸²	43.04 ¹⁴¹
35.9	21.588	3.74	26.568	35.09	40.88	57.46	29.763	41.63
Mean Place	17.948	0.68	23.753	41.90	36.038	59.05	25.373	42.21
Sec δ , Tan δ	1.096	-0.447	1.003	+0.074	2.038	-1.776	1.550	-1.184
$D\phi\alpha$, $D\alpha\alpha$	+0.07	-0.01	+0.06	0.00	+0.11	-0.02	+0.09	-0.01
$D\phi\delta$, $D\delta\delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Herculis. Mag. 4.5		λ Scorpi. Mag. 1.7		β Draconis. Mag. 3.0		α Ophiuchi. Mag. 2.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 27	° ' " +26 10	h m 17 27	° ' " -37 2	h m 17 28	° ' " +52 21	h m 17 31	° ' " +12 36
Jan. 1.0	22.393	12.97	57.934	40.67	31.752	35.01	4.446	63.80
10.9	22.588 195	10.26 271	58.201 267	40.08 59	31.955 208	31.63 338	4.642 196	61.67 213
20.9	22.820 232	7.73 253	58.507 306	39.64 44	32.219 264	28.50 313	4.871 229	59.62 205
30.9	23.082 262	5.45 228	58.842 335	39.34 30	32.533 314	25.72 278	5.127 256	57.77 185
Feb. 9.8	23.367 285	3.53 192	59.199 357	39.18 16	32.889 356	23.41 231	5.402 275	56.19 158
	301	150	370	4	385	177	289	126
19.8	23.668	2.03	59.569	39.14	33.274	21.64	5.691	54.93
Mar. 1.8	23.978 310	1.02 101	59.947 378	39.21 7	33.680 406	20.49 115	5.987 296	54.05 88
11.8	24.291 313	0.53 49	60.326 379	39.38 17	34.094 411	20.00 49	6.285 298	53.58 47
21.7	24.600 309	0.58 5	60.701 375	39.63 25	34.505 414	20.15 15	6.581 296	53.54 4
31.7	24.900 300	1.15 57	61.068 367	39.94 31	34.903 398	20.96 81	6.871 290	53.92 35
	288	106	354	38	378	143	278	79
Apr. 10.7	25.188	2.21	61.422	40.32	35.281	22.39	7.149	54.71
20.7	25.459 271	3.71 150	61.759 337	40.77 45	35.627 346	24.35 196	7.412 263	55.85 114
30.6	25.706 247	5.59 188	62.076 317	41.29 52	35.935 308	26.77 242	7.657 245	57.29 144
May 10.6	25.927 221	7.78 219	62.366 290	41.87 58	36.199 264	29.57 280	7.880 223	58.98 169
20.6	26.118 191	10.18 240	62.625 259	42.51 64	36.412 213	32.65 308	8.077 197	60.84 186
	157	256	226	71	160	326	167	198
30.5	26.275	12.74	62.851	43.22	36.572	35.91	8.244	62.82
June 9.5	26.395 120	15.36 262	63.036 185	43.98 76	36.874 102	39.24 333	8.378 134	64.85 203
19.5	26.477 82	17.97 261	63.178 142	44.76 78	36.715 41	42.56 332	8.476 98	66.87 202
29.5	26.517 40	20.48 251	63.272 94	45.56 80	36.697 17	45.77 321	8.536 60	68.82 196
July 9.4	26.516 1	22.86 238	63.318 46	46.36 80	36.620 73	48.78 301	8.557 21	70.66 184
	43	216	3	75	135	277	18	168
19.4	26.473	25.02	63.315	47.11	36.485	51.55	8.539	72.34
29.4	26.390 83	26.95 193	63.264 51	47.78 67	36.295 190	53.98 243	8.482 57	73.83 149
Aug. 8.4	26.271 119	28.58 163	63.167 97	48.36 58	36.057 238	56.03 205	8.390 92	75.10 127
18.3	26.119 152	29.88 130	63.030 137	48.80 44	35.779 278	57.67 164	8.268 124	76.14 104
28.3	25.941 178	30.85 97	62.859 171	49.08 28	35.465 314	58.85 118	8.116 150	76.91 77
	198	60	194	10	337	70	170	52
Sept. 7.3	25.743	31.45	62.665	49.18	35.128	59.55	7.946	77.43
17.2	25.534 209	31.67 22	62.457 208	49.08 10	34.778 350	59.75 20	7.765 181	77.66 23
27.2	25.324 210	31.50 17	62.247 210	48.76 32	34.425 353	59.44 31	7.581 184	77.62 4
Oct. 7.2	25.121 203	30.95 55	62.047 200	48.26 50	34.083 342	58.61 88	7.405 176	77.28 34
17.2	24.936 185	30.02 93	61.870 177	47.57 69	33.765 318	57.29 182	7.246 159	76.65 63
	166	132	144	83	285	180	132	90
27.1	24.780	28.70	61.726	46.74	33.480	55.49	7.114	75.75
Nov. 6.1	24.659 121	27.03 167	61.628 98	45.80 94	33.242 238	53.23 226	7.014 100	74.56 119
16.1	24.581 78	25.03 200	61.583 45	44.79 101	33.061 181	50.58 265	6.956 58	73.11 145
26.1	24.550 31	22.75 228	61.595 12	43.77 102	32.943 118	47.58 300	6.943 13	71.41 170
Dec. 6.0	24.570 20	20.23 252	61.666 71	42.77 100	32.894 49	44.32 396	6.978 35	69.52 189
	71	268	130	93	21	344	83	204
16.0	24.641	17.55	61.796	41.84	32.915	40.88	7.061	67.48
26.0	24.762 121	14.79 276	61.981 185	41.01 83	33.009 94	37.38 350	7.189 128	65.33 215
35.9	24.930 168	12.04 275	62.218 237	40.33 68	33.171 162	33.92 346	7.359 170	63.17 216
Mean Place	23.022	20.76	58.232	39.60	33.393	44.46	4.857	70.14
Sec δ , Tan δ	1.114	+0.491	1.253	-0.755	1.633	+1.297	1.025	+0.224
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.05	0.00	+0.08	-0.01	+0.03	+0.01	+0.06	0.00
$D_{\psi} \delta$, $D_{\omega} \delta$	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0	-0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Serpentis. Mag. 3.6			ϵ Herculis. Mag. 3.8			ω Draconis. Mag. 4.9			γ Pavonis. Mag. 3.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	17 32		-15 20	17 37		+46 2	17 37		+68 47	17 37		-64 40
Jan. 1.0	49.718		53.42	6.016		51.45	22.44		38.01	33.76		68.17
10.9	49.938	220	54.06	6.203	187	48.16	22.67	23	34.55	34.17	41	68.07
20.9	50.190	262	54.73	6.442	230	45.09	23.01	34	31.31	34.66	49	64.21
30.9	50.466	276	55.40	6.725	283	42.35	23.44	43	28.44	35.22	56	62.66
Feb. 9.8	50.760	294	56.03	7.045	320	40.03	23.95	51	26.03	35.83	61	61.43
		307			347			57			64	
19.8	51.067		56.57	7.392		38.23	24.52		24.18	36.47		60.53
Mar. 1.8	51.380	813	56.99	7.756	364	37.02	25.14	62	22.95	37.13	66	59.99
11.8	51.695	815	57.27	8.129	373	36.43	25.78	64	22.39	37.80	67	59.80
21.7	52.007	812	57.41	8.502	373	36.49	26.42	64	22.52	38.47	67	59.95
31.7	52.312	805	57.40	8.866	364	37.17	27.05	63	23.30	39.12	65	60.43
		296			346			59			63	
Apr. 10.7	52.608		57.24	9.212		38.45	27.64		24.73	39.75		61.23
20.7	52.890	282	56.95	9.536	324	40.27	28.18	54	26.71	40.36	61	62.32
30.6	53.155	265	56.56	9.828	292	42.55	28.65	47	29.19	40.91	55	63.68
May 10.6	53.401	246	56.09	10.084	256	45.22	29.04	39	32.05	41.42	51	65.29
20.6	53.621	220	55.58	10.299	215	48.17	29.33	29	35.22	41.87	45	67.10
		192			168			21			39	
30.5	53.813		55.04	10.467		51.31	29.54		38.59	42.26		69.09
June 9.5	53.972	159	54.51	10.585	118	54.54	29.65	11	42.05	42.57	31	71.22
19.5	54.095	123	54.01	10.652	67	57.77	29.65	0	45.51	42.79	22	73.41
29.5	54.180	85	53.54	10.665	13	60.92	29.55	10	48.87	42.92	13	75.63
July 9.4	54.226	46	53.12	10.625	40	63.89	29.34	21	52.05	42.96	4	77.80
		3			98			30			4	
19.4	54.229		52.75	10.532		66.63	29.04		54.96	42.92		79.85
29.4	54.192	37	52.43	10.390	142	69.06	28.66	38	57.55	42.79	13	81.74
Aug. 8.4	54.117	75	52.16	10.202	188	71.14	28.20	46	59.75	42.58	21	83.37
18.3	54.007	110	51.94	9.976	226	72.83	27.67	53	61.53	42.29	29	84.71
28.3	53.870	137	51.73	9.716	280	74.08	27.09	58	62.84	41.93	36	85.69
		159			234			62			40	
Sept. 7.3	53.711		51.55	9.432		74.88	26.47		63.65	41.53		86.26
17.2	53.540	171	51.38	9.134	298	75.20	25.82	65	63.95	41.11	42	86.39
27.2	53.366	174	51.23	8.833	301	75.02	25.17	65	63.72	40.68	43	86.06
Oct. 7.2	53.201	165	51.11	8.539	294	74.36	24.54	63	62.97	40.27	41	85.29
17.2	53.053	148	51.02	8.264	275	73.21	23.94	60	61.69	39.90	37	84.08
		120			244			55			32	
27.1	52.933		50.98	8.020		71.59	23.39		59.91	39.58		82.49
Nov. 6.1	52.848	85	51.00	7.816	204	69.54	22.90	49	57.66	39.34	24	80.57
16.1	52.807	41	51.10	7.662	154	67.07	22.49	41	54.99	39.18	16	78.37
26.1	52.814	7	51.31	7.565	97	64.26	22.18	31	51.95	39.13	5	76.00
Dec. 6.0	52.869	55	51.62	7.527	31	61.16	21.99	19	48.64	39.18	5	73.53
		105			26			8			17	
16.0	52.974		52.04	7.553		57.88	21.91		45.13	39.35		71.06
26.0	53.125	151	52.55	7.643	90	54.51	21.95	4	41.55	39.61	26	68.66
35.9	53.318	198	53.15	7.793	150	51.16	22.10	15	37.99	39.96	35	66.42
Mean Place	49.942		50.00	7.326		59.82	26.140		47.02	34.919		69.06
Sec δ , Tan δ	1.037		-0.274	1.441		+1.037	2.765		+2.578	2.339		-2.114
$D\phi a$, $D_\omega a$	+0.07		0.00	+0.03		+0.01	-0.01		+0.02	+0.11		-0.01
$D\phi \delta$, $D_\omega \delta$	0.0		-1.0	0.0		-1.0	0.0		-1.0	0.0		-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ophiuchi. Mag. 2.9		ι^1 Scorpii. Mag. 3.1		μ Herculis. Mag. 3.5		ψ Draconis. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 39	° ' " + 4 35	h m 17 41	° ' " -40 5	h m 17 43	° ' " +27 45	h m 17 43	° ' " +72 10
	s	"	s	"	s	"	s	"
Jan. 1.0	21.976	58.55	46.402	46.89	11.871	59.55	20.03	75.30
10.9	22.168 ¹⁹²	56.83 ¹⁷²	46.664 ²⁶²	46.02 ⁸⁷	12.049 ¹⁷⁸	56.77 ²⁷⁸	20.26 ²³	71.83 ³⁴⁷
20.9	22.394 ²²⁶	55.18 ¹⁶⁸	46.966 ³⁰²	45.31 ⁷¹	12.266 ²¹⁷	54.15 ²⁶²	20.61 ³⁵	68.56 ³²⁷
30.9	22.646 ²⁵²	53.66 ¹⁵²	47.301 ³³⁵	44.74 ⁵⁷	12.516 ²⁵⁰	51.76 ²³⁹	21.08 ⁴⁷	65.64 ²⁹²
Feb. 9.9	22.917 ²⁷¹	52.34 ¹³²	47.662 ³⁶¹	44.33 ⁴¹	12.791 ²⁷⁵	49.73 ²⁰⁸	21.66 ⁵⁸	63.18 ²⁴⁶
19.8	23.202 ²⁸⁵	51.29 ¹⁰⁶	48.039 ³⁷⁷	44.06 ²⁷	13.084 ²⁹⁸	48.12 ¹⁶¹	22.31 ⁶⁵	61.27 ¹⁹¹
Mar. 1.8	23.495 ²⁹⁸	50.54 ⁷⁵	48.428 ³⁸⁹	43.91 ¹⁵	13.392 ³⁰⁸	47.00 ¹¹²	23.02 ⁷¹	59.97 ¹³⁰
11.8	23.791 ²⁹⁶	50.12 ⁴²	48.820 ³⁹²	43.89 ²	13.704 ³¹²	46.41 ⁵⁹	23.77 ⁷⁵	59.32 ⁶⁵
21.7	24.086 ²⁹⁸	50.06 ⁶	49.211 ³⁹¹	43.97 ⁸	14.017 ³¹³	46.35 ⁶	24.52 ⁷⁵	59.36 ⁴
31.7	24.376 ²⁹⁰	50.36 ³⁰	49.596 ³⁸⁵	44.18 ²¹	14.323 ³⁰⁶	46.85 ⁵⁰	25.25 ⁷³	60.06 ⁷⁰
Apr. 10.7	24.656 ²⁸⁰	50.99 ⁶³	49.972 ³⁷⁶	44.49 ³¹	14.620 ²⁹⁷	47.84 ⁹⁹	25.94 ⁶⁹	61.39 ¹³²
20.7	24.924 ²⁶⁸	51.90 ⁹¹	50.330 ³⁵⁸	44.89 ⁴⁰	14.901 ²⁸¹	49.30 ¹⁴⁶	26.56 ⁶²	63.31 ¹⁹²
30.6	25.175 ²⁵¹	53.09 ¹¹⁹	50.668 ³³⁸	45.39 ⁵⁰	15.160 ²⁵⁹	51.15 ¹⁸⁵	27.12 ⁵⁶	65.72 ²⁴¹
May 10.6	25.407 ²³²	54.47 ¹³⁸	50.981 ³¹²	45.99 ⁶⁰	15.396 ²³⁶	53.35 ²²⁰	27.58 ⁴⁶	68.52 ²⁸⁰
20.6	25.613 ²⁰⁶	56.00 ¹⁵³	51.265 ²⁸⁴	46.69 ⁷⁰	15.601 ²⁰⁵	55.78 ²⁴²	27.93 ³⁵	71.64 ³¹²
30.6	25.792 ¹⁴⁷	57.63 ¹⁶⁷	51.512 ²⁰⁷	47.47 ⁸⁵	15.772 ¹³⁶	58.39 ²⁶⁸	28.17 ¹¹	74.96 ³⁴⁴
June 9.5	25.939 ¹¹²	59.30 ¹⁶⁵	51.719 ¹⁶¹	48.32 ⁹¹	15.908 ⁹⁶	61.07 ²⁷⁰	28.28 ⁰	78.40 ³⁴⁴
19.5	26.061 ⁷⁵	60.95 ¹⁵⁹	51.880 ¹¹³	49.23 ⁹⁵	16.004 ⁵³	63.77 ²⁶¹	28.28 ¹³	81.84 ³³⁶
29.5	26.126 ³⁶	62.54 ¹⁵⁰	51.993 ⁶³	50.18 ⁹⁶	16.057 ⁹	66.38 ²⁴⁹	28.15 ²⁴	85.20 ³¹⁹
July 9.4	26.162 ²	64.04 ¹³⁷	52.056 ⁹	51.14 ⁹⁸	16.066 ³³	68.87 ²³⁰	27.91 ³⁶	88.39 ²⁹⁴
19.4	26.160 ⁴²	65.41 ¹²³	52.065 ⁴²	52.07 ⁸⁵	16.083 ⁷⁵	71.17 ²⁰⁵	27.55 ⁴⁶	91.33 ²⁶²
29.4	26.118 ⁷⁹	66.64 ¹⁰⁴	52.023 ⁹¹	52.92 ⁷⁵	15.958 ¹¹⁴	73.22 ¹⁷⁶	27.09 ⁵⁶	93.95 ²²⁵
Aug. 8.4	26.039 ¹¹²	67.68 ⁸⁷	51.932 ¹³⁵	53.67 ⁶²	15.844 ¹⁴⁸	74.98 ¹⁴⁵	26.53 ⁶³	96.20 ¹⁸³
18.3	25.927 ¹³⁸	68.55 ⁶⁶	51.797 ¹⁷²	54.29 ²³	15.696 ¹⁷⁸	76.43 ¹⁰⁹	25.90 ⁷⁵	98.03 ¹³⁷
28.3	25.789 ¹⁶⁰	69.21 ⁴⁷	51.625 ²⁰⁰	54.74 ⁴⁵	15.518 ¹⁹⁹	77.52 ⁷²	25.21 ⁶⁹	99.40 ⁸⁸
Sept. 7.3	25.629 ¹⁷²	69.68 ²⁵	51.425 ²¹⁸	54.97 ²	15.319 ²¹⁴	78.24 ³⁴	24.46 ⁷⁷	100.28 ³⁷
17.3	25.457 ¹⁷⁶	69.93 ⁴	51.207 ²²³	54.99 ²¹	15.105 ²¹⁸	78.58 ⁶	23.69 ⁷⁸	100.65 ¹⁶
27.2	25.281 ¹⁷¹	69.97 ¹⁸	50.984 ²¹²	54.78 ⁴⁴	14.887 ²¹¹	78.52 ⁴⁵	22.91 ⁷⁶	100.49 ⁶⁸
Oct. 7.2	25.110 ¹⁵³	69.79 ³⁹	50.772 ¹⁹⁵	54.34 ⁶⁶	14.676 ¹⁹⁷	78.07 ⁸⁵	22.15 ⁷⁴	99.81 ¹²⁰
17.2	24.957 ¹²⁸	69.40 ⁶²	50.577 ¹⁶¹	53.68 ⁸⁵	14.479 ¹⁷¹	77.22 ¹²⁵	21.41 ⁶⁸	98.61 ¹⁷¹
27.1	24.829 ⁹⁷	68.78 ⁸⁴	50.416 ¹¹⁷	52.83 ¹⁰¹	14.308 ¹³⁸	75.97 ¹⁶²	20.73 ⁶⁰	96.90 ²¹⁸
Nov. 6.1	24.732 ⁵⁶	67.94 ¹⁰⁵	50.299 ⁶⁵	51.82 ¹¹²	14.170 ⁹⁵	74.35 ¹⁹⁷	20.13 ⁵¹	94.72 ²⁶²
16.1	24.676 ¹²	66.89 ¹²⁶	50.234 ⁷	50.70 ¹¹⁹	14.075 ⁴⁹	72.38 ²²⁷	19.62 ⁴⁰	92.10 ²⁹⁶
26.1	24.664 ³⁵	65.63 ¹⁴³	50.227 ⁵⁵	49.51 ¹¹⁷	14.026 ¹	70.11 ²⁵³	19.22 ²⁷	89.12 ³²⁷
Dec. 6.0	24.699 ⁸²	64.20 ¹⁵⁹	50.282 ¹¹⁶	48.34 ¹¹⁵	14.027 ⁵²	67.58 ²⁷⁰	18.95 ¹⁴	85.85 ³⁴⁹
16.0	24.781 ¹²⁶	62.61 ¹⁶⁸	50.398 ¹⁷⁵	47.19 ¹⁰⁷	14.079 ¹⁰¹	64.88 ²⁸¹	18.81 ⁰	82.36 ³⁵⁷
26.0	24.907 ¹⁶⁸	60.93 ¹⁷⁰	50.573 ²²⁸	46.12 ⁹⁶	14.180 ¹⁴⁹	62.07 ²⁸¹	18.81 ¹⁴	78.79 ³⁵⁴
36.0	25.075	59.23	50.801	45.16	14.329	59.26	18.95	75.25
Mean Place	22.313	63.81	46.752	45.73	12.573	66.42	24.658	83.68
Sec δ , Tan δ	1.003	+0.080	1.307	-0.842	1.130	+0.527	3.270	+3.113
$D\psi\alpha$, $D_\omega\alpha$	+0.06	0.00	+0.08	0.00	+0.05	0.00	-0.02	+0.01
$D\psi\delta$, $D_\omega\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ophiuchi. Mag. 3.7		δ Herculis. Mag. 5.5		ξ Draconis. Mag. 3.9		ζ Draconis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 43	° ' " + 2 44	h m 17 52	° ' " + 26 3	h m 17 52	° ' " + 56 52	h m 17 58	° ' " + 76 58
Jan. 1.0	43.487	10.43	3.630	38.58	3.596	59.95	3.01	21.45
10.9	43.677 ¹⁹⁰	8.82 ¹⁶¹	3.800 ¹⁷⁰	35.90 ²⁰⁸	3.767 ¹⁷¹	56.49 ³⁴⁶	3.24 ²³	18.01 ³⁴⁴
20.9	43.901 ²²⁴	7.27 ¹⁵⁵	4.009 ²⁰⁹	33.36 ²⁵⁴	4.010 ²⁴³	53.22 ³²⁷	3.64 ⁴⁰	14.75 ³²⁶
30.9	44.151 ²⁵⁰	5.84 ¹⁴³	4.250 ²⁴¹	31.03 ²³³	4.314 ³⁰⁴	50.28 ²⁹⁴	4.21 ⁵⁷	11.82 ²⁹³
Feb. 9.9	44.420 ²⁶⁹	4.59 ¹²⁵	4.518 ²⁶⁸	29.04 ¹⁹⁹	4.671 ³⁵⁷	47.76 ²⁵²	4.93 ⁷²	9.32 ²⁵⁰
19.8	44.703 ²⁸³	3.58 ¹⁰¹	4.806 ²⁸⁸	27.46 ¹⁵⁸	5.070 ³⁹⁹	45.77 ¹⁹⁹	5.76 ⁸³	7.34 ¹⁹⁸
Mar. 1.8	44.995 ²⁹²	2.86 ⁷²	5.108 ³⁰²	26.34 ¹¹²	5.498 ⁴²⁸	44.38 ¹³⁹	6.68 ⁹²	5.96 ¹³⁸
11.8	45.291 ²⁹⁶	2.47 ³⁹	5.416 ³⁰⁸	25.72 ⁶²	5.945 ⁴⁴⁷	43.62 ⁷⁶	7.65 ⁹⁷	5.22 ⁷⁴
21.7	45.586 ²⁹⁵	2.40 ⁷	5.726 ³¹⁰	25.64 ⁸	6.397 ⁴⁵²	43.55 ⁷	8.65 ¹⁰⁰	5.15 ⁷
31.7	45.877 ²⁹¹	2.66 ²⁶	6.032 ³⁰⁶	26.09 ⁴⁵	6.842 ⁴⁴⁵	44.13 ⁵⁸	9.63 ⁹⁸	5.74 ⁵⁹
Apr. 10.7	46.160 ²⁸³	3.25 ⁵⁹	6.329 ²⁹⁷	27.05 ⁹⁶	7.270 ⁴²⁸	45.35 ¹²²	10.56 ⁹³	6.96 ¹²³
20.7	46.430 ²⁷⁰	4.11 ⁸⁶	6.613 ²⁸⁴	28.45 ¹⁴⁰	7.669 ³⁹⁹	47.15 ¹⁸⁰	11.41 ⁸⁵	8.76 ¹⁸⁰
30.6	46.683 ²⁵³	5.23 ¹¹²	6.877 ²⁶⁴	30.26 ¹⁸¹	8.030 ³⁶¹	49.45 ²⁸⁰	12.15 ⁷⁴	11.07 ²⁸¹
May 10.6	46.918 ²³⁵	6.53 ¹³⁰	7.119 ²⁴²	32.40 ²¹⁴	8.345 ³¹⁵	52.18 ²⁷³	12.77 ⁶²	13.79 ²⁷²
20.6	47.129 ²¹¹	7.98 ¹⁴⁵	7.332 ²¹³	34.79 ²³⁹	8.606 ²⁶¹	55.24 ³⁰⁶	13.26 ⁴⁹	16.85 ³⁰⁶
30.6	47.313 ¹⁸⁴	9.52 ¹⁵⁴	7.514 ¹⁸³	37.36 ²⁵⁷	8.807 ²⁰¹	58.51 ³²⁷	13.57 ³¹	20.13 ³²⁸
June 9.5	47.465 ¹⁵²	11.09 ¹⁵⁷	7.660 ¹⁴⁶	40.02 ²⁶⁶	8.944 ¹³⁷	61.92 ³⁴¹	13.72 ¹⁵	23.54 ³⁴¹
19.5	47.583 ¹¹⁸	12.65 ¹⁵⁶	7.766 ¹⁰⁶	42.69 ²⁶⁷	9.014 ⁷⁰	65.36 ³⁴⁴	13.71 ¹	26.98 ³⁴⁴
29.5	47.664 ⁸¹	14.16 ¹⁵¹	7.831 ⁶⁵	45.30 ²⁶¹	9.016 ²	68.74 ³³⁸	13.54 ³¹	30.36 ³³⁸
July 9.4	47.705 ⁴¹	15.58 ¹⁴²	7.854 ²⁸	47.79 ²⁴⁹	8.950 ⁶⁶	71.97 ³²³	13.20 ³⁴	33.59 ³²³
19.4	47.708 ³	16.88 ¹³⁰	7.833 ²¹	50.11 ²³²	8.818 ¹³²	74.96 ²⁹⁹	12.71 ⁴⁹	36.58 ²⁹⁹
29.4	47.671 ³⁷	18.02 ¹¹⁴	7.770 ⁶³	52.18 ²⁰⁷	8.621 ¹⁹⁷	77.66 ²⁷⁰	12.08 ⁶³	39.29 ²⁷¹
Aug. 8.4	47.597 ⁷⁴	19.01 ⁹⁹	7.667 ¹⁰³	53.99 ¹⁸¹	8.368 ²⁵³	80.02 ²⁸⁶	11.31 ⁷⁷	41.65 ²⁸⁶
18.3	47.497 ¹⁰⁷	19.83 ⁸²	7.529 ¹³⁸	55.48 ¹⁴⁹	8.065 ³⁰³	81.97 ¹⁹⁵	10.45 ⁸⁶	43.60 ¹⁹⁵
28.3	47.355 ¹³⁵	20.45 ⁶²	7.361 ¹⁶⁸	56.63 ¹¹⁵	7.719 ³⁴⁶	83.47 ¹⁵⁰	9.49 ⁹⁶	45.10 ¹⁵⁰
Sept. 7.3	47.198 ¹⁵⁷	20.90 ⁴⁵	7.170 ¹⁹¹	57.43 ⁸⁰	7.342 ³⁷⁷	84.50 ¹⁰⁸	8.46 ¹⁰³	46.13 ¹⁰³
17.3	47.027 ¹⁷¹	21.14 ²⁴	6.963 ²⁰⁷	57.86 ⁴³	6.943 ³⁹⁹	85.02 ⁸²	7.40 ¹⁰⁶	46.66 ⁸²
27.2	46.852 ¹⁷⁵	21.20 ⁶	6.751 ²¹²	57.90 ⁴	6.538 ⁴⁰⁵	85.02 ⁰	6.32 ¹⁰⁸	46.66 ⁰
Oct. 7.2	46.684 ¹⁶⁸	21.04 ¹⁶	6.543 ²⁰⁸	57.55 ³⁵	6.139 ³⁹⁹	84.50 ⁸²	5.25 ¹⁰⁷	46.15 ⁵¹
17.2	46.529 ¹⁵⁵	20.70 ³⁴	6.348 ¹⁹⁵	56.81 ⁷⁴	5.757 ³⁸²	83.47 ¹⁰³	4.21 ¹⁰⁴	45.12 ¹⁰³
27.1	46.400 ¹²⁹	20.15 ⁵⁵	6.178 ¹⁷⁰	55.69 ¹¹²	5.409 ³⁴⁸	81.93 ¹⁵⁴	3.24 ⁹⁷	43.59 ¹⁵³
Nov. 6.1	46.301 ⁹⁹	19.38 ⁷⁷	6.039 ¹³⁹	54.20 ¹⁴⁹	5.105 ³⁰⁴	79.90 ²⁰⁸	2.36 ⁸⁸	41.58 ²⁰¹
16.1	46.243 ⁵⁸	18.42 ⁹⁶	5.940 ⁹⁹	52.38 ¹⁸²	4.857 ²⁴⁸	77.43 ²⁴⁷	1.62 ⁷⁴	39.12 ²⁴⁶
26.1	46.229 ¹⁴	17.26 ¹¹⁶	5.887 ⁵³	50.24 ²¹⁴	4.675 ¹⁸²	74.59 ²⁸⁴	1.00 ⁶²	36.29 ²⁸³
Dec. 6.0	46.262 ³³	15.94 ¹³²	5.882 ⁵	47.86 ²³⁸	4.565 ¹¹⁰	71.42 ³¹⁷	0.55 ⁴⁵	33.14 ³¹⁵
16.0	46.341 ⁷⁹	14.48 ¹⁴⁶	5.928 ⁴⁶	45.28 ²⁵⁸	4.533 ³²	68.04 ³³⁸	0.28 ²⁷	29.77 ³³⁷
26.0	46.465 ¹²⁴	12.92 ¹⁵⁶	6.022 ⁹⁴	42.59 ²⁶⁹	4.580 ⁴⁷	64.53 ³⁵¹	0.20 ⁸	26.28 ³⁴⁹
36.0	46.630 ¹⁶⁵	11.32 ¹⁶⁰	6.163 ¹⁴¹	39.88 ²⁷¹	4.703 ¹²³	61.03 ³⁵⁰	0.30 ¹⁰	22.79 ³⁴⁹
Mean Place	43.813	15.38	4.310	44.75	5.684	67.24	9.799	28.71
Sec δ , Tan δ	1.001	+0.048	1.113	+0.489	1.830	+1.533	4.437	+4.323
$D\psi a$, $D_\omega a$	+0.06	0.00	+0.05	0.00	+0.02	0.00	-0.05	+0.01
$D\psi \delta$, $D_\omega \delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Herculis. Mag. 4.0		ν Ophiuchi. Mag. 3.5		ξ Herculis. Mag. 3.8		γ Draconis. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 53	° ' " +37 15	h m 17 54	° ' " - 9 45	h m 17 54	° ' " +29 15	h m 17 54	° ' " +51 29
	s 17 53	" +37 15	s 17 54	" - 9 45	s 17 54	" +29 15	s 17 54	" +51 29
Jan. 1.0	23.386	32.31	27.130	55.65	31.620	15.75	39.040	46.42
10.9	23.551 ¹⁶⁵	29.24 ³⁰⁷	27.322 ¹⁹²	56.53 ⁸⁸	31.786 ¹⁶⁶	12.95 ²⁸⁰	39.204 ¹⁶⁴	43.03 ³³⁹
20.9	23.762 ²¹¹	26.33 ²⁹¹	27.549 ²²⁷	57.40 ⁸⁷	31.993 ²⁰⁷	10.29 ²⁶⁶	39.429 ²²⁵	39.82 ³²¹
30.9	24.013 ²⁵¹	23.70 ²⁶⁸	27.802 ²⁵³	58.23 ⁸³	32.234 ²⁴¹	7.86 ²⁴³	39.708 ²⁷⁹	36.91 ²⁹¹
Feb. 9.9	24.294 ²⁸¹	21.43 ²³⁷	28.075 ²⁷³	58.96 ⁷³	32.504 ²⁷⁰	5.78 ²⁰⁸	40.032 ³²⁴	34.42 ²⁴⁹
	307	180	288	60	290	166	360	198
19.8	24.601	19.63	28.363	59.56	32.794	4.12	40.392	32.44
Mar. 1.8	24.925 ³²⁴	18.36 ¹²⁷	28.661 ²⁹⁸	59.99 ⁴³	33.099 ³⁰⁵	2.94 ¹¹⁸	40.778 ³⁸⁶	31.04 ¹⁴⁰
11.8	25.259 ³³⁴	17.67 ⁶⁹	28.964 ³⁰³	60.22 ²⁸	33.413 ³¹⁴	2.29 ⁶⁵	41.179 ⁴⁰¹	30.27 ⁷⁷
21.8	25.596 ³³⁷	17.57 ¹⁰	29.268 ³⁰⁴	60.25 ³	33.729 ³¹⁶	2.20 ⁹	41.585 ⁴⁰⁶	30.16 ¹¹
31.7	25.929 ³³⁸	18.08 ⁵¹	29.570 ³⁰²	60.06 ¹⁹	34.042 ³¹³	2.65 ⁴⁵	41.986 ⁴⁰¹	30.71 ⁵⁵
	322	107	296	88	302	98	387	116
Apr. 10.7	26.251	19.15	29.865	59.68	34.344	3.63	42.373	31.87
20.7	26.556 ³⁰⁵	20.74 ¹⁵⁹	30.150 ²⁸⁵	59.13 ⁵⁵	34.634 ²⁹⁰	5.08 ¹⁴⁵	42.735 ³⁴²	33.60 ¹⁷³
30.6	26.840 ²⁸⁴	22.79 ²⁰⁵	30.422 ²⁷²	58.42 ⁷¹	34.905 ²⁷¹	6.95 ¹⁸⁷	43.068 ³³³	35.84 ²²⁴
May 10.6	27.094 ²⁵⁴	25.20 ²⁴¹	30.674 ²⁵²	57.60 ⁸²	35.151 ²⁴⁸	9.17 ²²²	43.361 ²⁹³	38.50 ²⁶⁶
20.6	27.316 ²²²	27.92 ²⁷²	30.905 ²⁸¹	56.71 ⁸⁹	35.367 ²¹⁶	11.67 ²⁵⁰	43.608 ²⁴⁷	41.48 ²⁹⁸
	185	291	203	92	184	267	196	321
30.6	27.501 ¹⁴²	30.83 ³⁰⁴	31.108	55.79	35.551 ¹⁴⁷	14.34 ³⁷⁷	43.804 ¹⁴⁰	44.69 ³³⁴
June 9.5	27.643 ⁹⁸	33.87 ³⁰⁴	31.281 ¹⁷³	54.86 ⁹³	35.698 ¹⁰⁶	17.11 ²⁷⁷	43.944 ⁸³	48.03 ³³⁷
19.5	27.741 ⁵¹	36.91 ³⁰⁰	31.421 ¹⁰⁰	53.96 ⁸⁵	35.804 ⁶⁴	19.91 ²⁷⁴	44.027 ²³	51.40 ³³¹
29.5	27.792 ²	39.91 ²⁸⁷	31.521 ⁶¹	53.11 ⁷⁸	35.868 ²¹	22.65 ²⁶²	44.050 ³⁸	54.71 ³¹⁸
July 9.4	27.794 ⁴⁵	42.78 ²⁶⁵	31.582 ¹⁹	52.33 ⁶⁸	35.889 ²⁵	25.27 ²⁴³	44.012 ⁹⁸	57.89 ²⁹⁶
19.4	27.749 ⁹¹	45.43 ²⁴¹	31.601 ²²	51.65 ⁶⁰	35.864 ⁹⁸	27.70 ²¹⁹	43.914 ¹⁵³	60.85 ²⁶⁷
29.4	27.658 ¹³⁴	47.84 ²⁰⁸	31.579 ⁶¹	51.05 ⁵⁰	35.796 ¹⁰⁸	29.89 ¹⁹¹	43.761 ²⁰⁶	63.52 ²³³
Aug. 8.4	27.524 ¹⁷³	49.92 ¹⁷³	31.518 ⁹⁶	50.55 ⁴²	35.688 ¹⁴⁴	31.80 ¹⁵⁸	43.555 ²⁵²	65.85 ¹⁹⁴
18.3	27.351 ²⁰⁶	51.65 ¹³⁵	31.422 ¹²⁸	50.13 ³³	35.544 ¹⁷⁶	33.38 ¹²³	43.303 ²⁸⁹	67.79 ¹⁵⁰
28.3	27.145 ²³⁰	53.00 ⁹³	31.294 ¹⁵⁰	49.80 ²³	35.368 ²⁰⁰	34.61 ⁸⁶	43.014 ³²⁰	69.29 ¹⁰⁴
Sept. 7.3	26.915	53.93	31.144	49.57	35.168	35.47	42.694	70.33
17.3	26.669 ²⁴⁶	54.42 ⁴⁹	30.977 ¹⁶⁷	49.40 ¹⁷	34.952 ²¹⁶	35.94 ⁴⁷	42.355 ³³⁹	70.88 ⁵⁵
27.2	26.417 ²⁵²	54.46 ⁴	30.804 ¹⁷³	49.30 ¹⁰	34.730 ²²²	35.98 ⁴	42.008 ³⁴⁷	70.92 ⁴
Oct. 7.2	26.168 ²⁴⁹	54.05 ⁴¹	30.636 ¹⁶⁸	49.29 ¹	34.512 ²¹⁸	35.63 ³⁵	41.665 ³⁴³	70.45 ⁴⁷
17.2	25.933 ²³⁵	53.18 ⁸⁷	30.481 ¹⁵⁵	49.36 ⁷	34.308 ²⁰⁴	34.88 ⁷⁵	41.340 ³²⁵	69.47 ⁹⁸
	208	131	131	16	181	117	296	147
27.1	25.725 ¹⁷⁴	51.87 ¹⁷⁴	30.350 ⁹⁹	49.52 ²⁷	34.127 ¹⁴⁸	33.71 ¹⁵⁵	41.044 ²⁵⁷	68.00 ¹⁹⁵
Nov. 6.1	25.551 ¹³²	50.13 ²¹⁴	30.251 ⁵⁹	49.79 ³⁶	33.979 ¹⁰⁸	32.16 ¹⁹⁰	40.787 ²⁰⁶	66.05 ²³⁷
16.1	25.419 ⁸³	47.99 ²⁴⁸	30.192 ¹⁵	50.15 ⁴⁵	33.871 ⁶²	30.26 ²⁴⁴	40.581 ¹⁴⁷	63.68 ²⁷⁷
26.1	25.336 ³⁰	45.51 ²⁷⁶	30.177 ³²	50.63 ⁶⁰	33.809 ¹³	28.02 ²⁴⁹	40.434 ⁸³	60.91 ³⁰⁶
Dec. 6.0	25.306 ²⁵	42.75 ²⁹⁷	30.209 ⁷⁹	51.23 ⁷¹	33.796 ³⁸	25.53 ²⁶⁹	40.351 ¹⁵	57.83 ³³⁰
16.0	25.331	39.78	30.288	51.94	33.834	22.84	40.336	54.53
26.0	25.410 ⁷⁹	36.68 ³¹⁰	30.413 ¹²⁵	52.72 ⁷⁸	33.923 ⁸⁹	20.03 ²⁸¹	40.391 ⁵⁵	51.10 ³⁴³
36.0	25.543 ¹³³	33.58 ³¹⁰	30.578 ¹⁶⁵	53.57 ⁸⁵	34.069 ¹³⁶	17.20 ²⁸³	40.512 ¹²¹	47.66 ³⁴⁴
Mean Place	24.377	38.91	27.394	51.93	32.377	21.90	40.717	53.36
Sec δ , Tan δ	1.257	+0.761	1.015	-0.172	1.146	+0.560	1.606	+1.257
$D\psi\alpha$, $D_\omega\alpha$	+0.04	0.00	+0.07	0.00	+0.05	0.00	+0.03	0.00
$D\psi\delta$, $D_\omega\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	67 Ophiuchi. Mag. 3.9		θ Arse. Mag. 3.9		γ Sagittarii. Mag. 3.1		70 Ophiuchi. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 56	° ' " + 2 55	h m 18 0	° ' " -50 5	h m 18 0	° ' " -30 25	h m 18 1	° ' " + 2 30
Jan. 1.0	28.956	80.11	9.617	55.83	28.202	36.85	15.211	59.50
10.9	29.136 180	58.53 158	9.890 273	54.29 154	28.418 216	36.45 40	15.387 176	57.93 157
20.9	29.348 212	56.99 154	10.216 326	52.90 139	28.673 255	36.13 32	15.596 209	56.40 153
30.9	29.587 239	55.58 141	10.585 369	51.70 120	28.959 286	35.90 23	15.833 237	54.99 141
Feb. 9.9	29.849 263	54.35 123	10.999 404	50.69 101	29.269 310	35.71 19	16.092 259	53.76 123
19.8	30.126 277	53.35 100	11.417 428	49.90 79	29.597 328	35.57 14	16.367 275	52.75 101
Mar. 1.8	30.414 288	52.65 70	11.863 446	49.32 58	29.937 340	35.46 11	16.654 287	52.03 72
11.8	30.707 293	52.27 38	12.319 456	48.94 38	30.283 346	35.36 10	16.947 293	51.62 41
21.8	31.002 296	52.21 6	12.779 460	48.79 15	30.632 349	35.28 8	17.243 296	51.55 7
31.7	31.295 298	52.60 29	13.235 456	48.85 6	30.979 347	35.21 7	17.537 294	51.81 26
Apr. 10.7	31.582 287	53.11 61	13.681 446	49.11 26	31.320 341	35.15 6	17.825 288	52.38 57
20.7	31.858 276	54.00 89	14.113 432	49.56 45	31.651 331	35.10 5	18.104 279	53.23 85
30.6	32.120 262	55.15 115	14.523 410	50.21 66	31.965 314	35.09 1	18.368 264	54.34 111
May 10.6	32.364 244	56.49 134	14.906 383	51.03 82	32.261 296	35.12 3	18.615 247	55.64 130
20.6	32.585 221	57.98 149	15.253 347	52.03 100	32.533 272	35.21 9	18.841 226	57.10 146
30.6	32.780 195	59.56 158	15.560 307	53.20 117	32.774 241	35.36 15	19.039 198	58.64 154
June 9.5	32.943 163	61.18 162	15.819 259	54.49 129	32.981 207	35.60 24	19.207 168	60.22 158
19.5	33.072 129	62.80 162	16.026 207	55.87 138	33.148 167	35.89 29	19.342 135	61.80 158
29.5	33.165 93	64.36 156	16.174 148	57.32 145	33.272 124	36.24 35	19.440 98	63.33 153
July 9.5	33.217 52	65.82 146	16.260 86	58.80 148	33.350 78	36.63 39	19.497 57	64.76 143
19.4	33.230 13	67.17 125	16.284 24	60.25 145	33.381 31	37.06 43	19.514 17	66.08 132
29.4	33.202 28	68.36 119	16.246 38	61.63 138	33.364 17	37.50 44	19.491 23	67.24 116
Aug. 8.4	33.135 67	69.40 104	16.147 99	62.88 125	33.301 63	37.91 41	19.429 62	68.24 100
18.3	33.035 100	70.26 86	15.993 154	63.94 106	33.197 104	38.28 37	19.334 95	69.07 83
28.3	32.904 131	70.93 67	15.793 200	64.78 84	33.057 140	38.57 29	19.206 128	69.71 64
Sept. 7.3	32.751 153	71.41 48	15.557 236	65.35 57	32.887 170	38.75 18	19.056 150	70.17 46
17.3	32.581 170	71.70 29	15.294 263	65.62 27	32.700 187	38.81 6	18.888 168	70.43 26
27.2	32.407 174	71.79 9	15.022 272	65.57 5	32.503 197	38.75 6	18.713 175	70.50 7
Oct. 7.2	32.235 172	71.68 11	14.753 269	65.17 40	32.310 193	38.54 21	18.541 172	70.36 14
17.2	32.077 158	71.35 33	14.505 248	64.46 71	32.133 177	38.21 33	18.383 158	70.03 33
27.2	31.940 137	70.83 52	14.290 215	63.46 100	31.982 151	37.77 44	18.245 138	69.50 53
Nov. 6.1	31.835 105	70.10 73	14.122 168	62.18 128	31.867 115	37.23 54	18.138 107	68.76 74
16.1	31.768 67	69.17 93	14.012 110	60.70 148	31.797 70	36.64 59	18.068 70	67.83 93
26.1	31.744 24	68.04 113	13.969 43	59.05 165	31.776 21	36.01 63	18.040 28	66.71 112
Dec. 6.0	31.765 21	66.75 129	13.995 26	57.33 172	31.809 33	35.39 62	18.057 17	65.43 128
16.0	31.832 67	65.32 143	14.094 99	55.58 175	31.895 86	34.81 58	18.120 63	64.01 142
26.0	31.943 111	63.79 153	14.261 167	53.86 172	32.034 139	34.28 53	18.227 107	62.49 152
36.0	32.096 153	62.21 158	14.494 233	52.24 162	32.219 185	33.82 46	18.378 151	60.93 156
Mean Place	29.302	64.66	10.166	54.79	28.482	34.56	15.559	63.87
Sec δ , Tan δ	1.001	+0.051	1.559	-1.196	1.160	-0.587	1.001	+0.044
$D\psi\alpha$, $D_\omega\alpha$	+0.06	0.00	+0.09	0.00	+0.08	0.00	+0.06	0.00
$D\psi\delta$, $D_\omega\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Ophiuchi. Mag. 3.7		O Herculis. Mag. 3.8		μ Sagittarii. Mag. 4.0		77 Sagittarii. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 3	° ' " + 9 32	h m 18 4	° ' " + 28 44	h m 18 8	° ' " - 21 4	h m 18 12	° ' " - 36 47
Jan. 1.0	24.426	59.76	17.497	55.50	47.686	56.76	0.362	17.29
11.0	24.593	57.84	17.653	52.72	47.878	56.89	0.579	16.45
20.9	24.796	56.00	17.850	50.08	48.107	57.05	0.838	15.69
30.9	25.026	54.31	18.081	47.65	48.365	57.23	1.132	15.04
Feb. 9.9	25.281	52.83	18.343	45.55	48.646	57.39	1.453	14.47
19.8	25.553	51.65	18.626	43.86	48.946	57.51	1.797	14.00
Mar. 1.8	25.837	50.81	18.927	42.64	49.257	57.57	2.155	13.60
11.8	26.128	50.34	19.237	41.94	49.576	57.55	2.523	13.29
21.8	26.423	50.27	19.562	41.79	49.898	57.45	2.894	13.07
31.7	26.716	50.60	19.865	42.19	50.220	57.26	3.267	12.91
Apr. 10.7	27.004	51.31	20.170	43.11	50.537	56.98	3.635	12.83
20.7	27.282	52.37	20.464	44.52	50.846	56.63	3.993	12.84
30.7	27.546	53.72	20.740	46.35	51.143	56.23	4.336	12.93
May 10.6	27.792	55.32	20.993	48.54	51.423	55.81	4.660	13.13
20.6	28.016	57.11	21.218	50.99	51.680	55.39	4.958	13.43
30.6	28.212	59.02	21.412	53.66	51.911	54.99	5.225	13.84
June 9.5	28.376	60.99	21.569	56.42	52.110	54.64	5.458	14.35
19.5	28.506	62.96	21.686	59.22	52.274	54.34	5.647	14.96
29.5	28.600	64.88	21.760	61.98	52.397	54.10	5.791	15.64
July 9.5	28.652	66.71	21.790	64.62	52.478	53.94	5.884	16.38
19.4	28.664	68.40	21.775	67.09	52.515	53.84	5.927	17.15
29.4	28.635	69.92	21.716	69.34	52.507	53.80	5.918	17.92
Aug. 8.4	28.567	71.24	21.616	71.30	52.457	53.79	5.859	18.64
18.4	28.463	72.34	21.479	72.94	52.366	53.81	5.753	19.29
28.3	28.330	73.22	21.309	74.25	52.241	53.84	5.608	19.83
Sept. 7.3	28.172	73.84	21.114	75.19	52.089	53.85	5.429	20.23
17.3	27.998	74.22	20.901	75.74	51.917	53.84	5.228	20.44
27.2	27.817	74.33	20.681	75.89	51.737	53.79	5.016	20.47
Oct. 7.2	27.638	74.18	20.463	75.63	51.558	53.71	4.806	20.29
17.2	27.472	73.78	20.258	74.96	51.393	53.59	4.608	19.92
27.2	27.326	73.10	20.073	73.89	51.249	53.44	4.436	19.36
Nov. 6.1	27.210	72.18	19.920	72.43	51.138	53.28	4.301	18.63
16.1	27.132	71.00	19.806	70.61	51.068	53.12	4.211	17.79
26.1	27.095	69.60	19.736	68.46	51.042	52.99	4.173	16.85
Dec. 6.1	27.102	67.99	19.715	66.05	51.065	52.90	4.192	15.86
16.0	27.156	66.23	19.743	63.41	51.138	52.88	4.268	14.88
26.0	27.255	64.36	19.822	60.65	51.258	52.91	4.400	13.92
36.0	27.395	62.45	19.947	57.85	51.422	53.00	4.583	13.02
Mean Place	24.848	64.42	18.259	60.95	47.943	53.84	0.696	15.14
Sec δ , Tan δ	1.014	+0.168	1.141	+0.549	1.072	-0.386	1.249	-0.748
$D\psi a$, $D_\omega a$	+0.06	0.00	+0.05	0.00	+0.07	0.00	+0.08	0.00
$D\psi \delta$, $D_\omega \delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2533. Mag. 5.4		36 Draconis. Mag. 5.0		δ Sagittarii. Mag. 2.8		77 Serpentis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 13	° ' " +42 7	h m 18 13	° ' " +64 21	h m 18 15	° ' " -29 51	h m 18 17	° ' " -2 55
Jan. 1.0	2.637	44.46	22.11	63.20	40.538	54.89	0.529	20.11
11.0	2.778 ¹⁴¹	41.27 ³¹⁹	22.24 ¹³	59.70 ³⁵⁰	40.739 ²⁰¹	54.44 ⁴⁵	0.693 ¹⁶⁴	21.32 ¹²¹
20.9	2.969 ¹⁹¹	38.22 ³⁰⁵	22.47 ²³	56.34 ³³⁶	40.976 ²³⁷	54.06 ³⁸	0.892 ¹⁹⁹	22.49 ¹¹⁷
30.9	3.205 ²⁹⁶	35.41 ²⁸¹	22.78 ³¹	53.25 ³⁰⁹	41.247 ²⁷¹	53.72 ³⁴	1.118 ²²⁶	23.59 ¹¹⁰
Feb. 9.9	3.479 ²⁷⁴	32.97 ²⁴⁴	23.17 ³⁹	50.54 ²⁷¹	41.545 ²⁹⁸	53.44 ²⁸	1.368 ²⁵⁰	24.55 ⁹⁶
19.8	3.784 ³⁰⁵	30.97 ²⁰⁰	23.62 ⁴⁵	48.33 ²²¹	41.861 ³¹⁶	53.18 ²⁶	1.636 ²⁶⁸	25.32 ⁷⁷
Mar. 1.8	4.112 ³²⁸	29.50 ¹⁴⁷	24.12 ⁵⁰	46.69 ¹⁶⁴	42.192 ³³¹	52.94 ²⁴	1.918 ²⁸²	25.86 ⁵⁴
11.8	4.457 ³⁴⁵	28.63 ⁸⁷	24.65 ⁵³	45.69 ¹⁰⁰	42.533 ³⁴¹	52.72 ²²	2.208 ²⁹⁰	26.13 ²⁷
21.8	4.811 ³⁵⁴	28.37 ²⁶	25.20 ⁵⁵	45.35 ³⁴	42.878 ³⁴⁵	52.49 ²³	2.503 ²⁹⁵	26.14 ¹
31.7	5.163 ³⁵²	28.72 ³⁵	25.75 ⁵⁵	45.68 ³³	43.224 ³⁴⁶	52.27 ²²	2.798 ²⁹⁵	25.86 ²⁸
Apr. 10.7	5.508 ³⁴⁵	29.67 ⁹⁵	26.29 ⁵⁴	46.68 ¹⁰⁰	43.566 ³⁴³	52.07 ²⁰	3.091 ²⁹³	25.32 ⁵⁴
20.7	5.840 ³³²	31.17 ¹⁵⁰	26.79 ⁵⁰	48.27 ¹⁵⁹	43.900 ³³⁴	51.87 ²⁰	3.377 ²⁸⁶	24.53 ⁷⁹
30.7	6.150 ³¹⁰	33.18 ²⁰¹	27.25 ⁴⁶	50.41 ²¹⁴	44.222 ³²²	51.70 ¹⁷	3.652 ²⁷⁵	23.54 ⁹⁹
May 10.6	6.432 ²⁸²	35.61 ²⁴³	27.66 ³¹	53.02 ²⁶¹	44.525 ³⁰³	51.59 ¹¹	3.911 ²⁵⁹	22.38 ¹¹⁶
20.6	6.680 ²⁴⁸	38.36 ²⁷⁵	27.99 ⁴³	56.01 ²⁹⁹	44.807 ²⁸²	51.54 ⁵	4.151 ²⁴⁰	21.11 ¹²⁷
30.6	6.889 ²⁰⁹	41.37 ³⁰¹	28.25 ²⁶	59.26 ³²⁵	45.061 ²⁶⁴	51.57 ⁸	4.365 ²¹⁴	19.78 ¹²³
June 9.5	7.053 ¹⁶⁴	44.53 ³¹⁶	28.44 ¹⁹	62.69 ³⁴³	45.280 ²¹⁹	51.67 ¹⁰	4.551 ¹⁸⁶	18.42 ¹³⁶
19.5	7.170 ¹¹⁷	47.75 ³²²	28.54 ¹⁰	66.21 ³⁵²	45.462 ¹⁸²	51.85 ¹⁸	4.702 ¹⁵¹	17.07 ¹³⁵
29.5	7.237 ⁶⁷	50.94 ³¹⁹	28.56 ²	69.70 ³⁴⁹	45.603 ¹⁴¹	52.13 ²⁸	4.817 ¹¹⁵	15.79 ¹²⁸
July 9.5	7.251 ¹⁴	54.03 ³⁰⁹	28.49 ⁷	73.10 ³⁴⁰	45.695 ⁹²	52.46 ³³	4.891 ⁷⁴	14.00 ¹¹⁹
19.4	7.214 ³⁷	56.94 ²⁹¹	28.33 ¹⁶	76.30 ³²⁰	45.740 ⁴⁵	52.85 ³⁹	4.924 ³³	13.51 ¹⁰⁹
29.4	7.126 ⁸⁸	59.60 ²⁶⁶	28.08 ²⁵	79.25 ²⁹⁵	45.738 ²	53.26 ⁴¹	4.916 ⁸	12.54 ⁹⁷
Aug. 8.4	6.991 ¹³⁵	61.97 ²⁸⁷	27.77 ³¹	81.87 ²⁶²	45.690 ⁴⁸	53.67 ⁴¹	4.868 ⁴⁸	11.72 ⁸²
18.4	6.812 ¹⁷⁹	63.97 ²⁰⁰	27.39 ³³	84.11 ²²⁴	45.597 ⁹⁸	54.06 ³⁹	4.782 ⁸⁶	11.05 ⁶⁷
28.3	6.595 ²¹⁷	65.58 ¹⁶¹	26.95 ⁴⁴	85.91 ¹⁸⁰	45.467 ¹³⁴	54.40 ³⁴	4.663 ¹¹⁹	10.52 ⁵³
Sept. 7.3	6.350 ²⁴⁵	66.77 ¹¹⁹	26.47 ⁴⁸	87.25 ¹³⁴	45.305 ¹⁶²	54.64 ²⁴	4.519 ¹⁴⁴	10.14 ³⁸
17.3	6.083 ²⁶⁷	67.51 ⁷⁴	25.96 ⁵¹	88.09 ⁸⁴	45.123 ¹⁸²	54.79 ¹⁵	4.355 ¹⁶⁴	9.91 ²⁸
27.2	5.807 ²⁷⁶	67.77 ²⁶	25.43 ⁵³	88.42 ³³	44.929 ¹⁹⁴	54.81 ²	4.182 ¹⁷³	9.82 ⁹
Oct. 7.2	5.530 ²⁷⁷	67.56 ²¹	24.90 ⁵³	88.21 ²¹	44.736 ¹⁹³	54.70 ¹¹	4.009 ¹⁷³	9.87 ⁵
17.2	5.266 ²⁶⁴	66.87 ⁹⁹	24.39 ⁵¹	87.46 ⁷⁵	44.554 ¹⁸²	54.45 ²⁵	3.847 ¹⁶²	10.07 ²⁰
27.2	5.023 ²⁴³	65.70 ¹¹⁷	23.91 ⁴⁸	86.19 ¹²⁷	44.396 ¹⁵⁸	54.10 ³⁵	3.704 ¹⁴³	10.43 ³⁶
Nov. 6.1	4.813 ²¹⁰	64.07 ¹⁶³	23.47 ⁴⁴	84.41 ¹⁷⁸	44.271 ¹²⁵	53.64 ⁴⁶	3.589 ¹¹⁵	10.93 ⁵⁰
16.1	4.644 ¹⁶⁹	62.01 ²⁰⁶	23.10 ³⁷	82.16 ²²⁵	44.189 ⁸²	53.11 ⁵³	3.510 ⁷⁹	11.58 ⁶⁵
26.1	4.523 ¹²¹	59.58 ²⁴³	22.80 ³⁰	79.48 ²⁶⁸	44.153 ³⁶	52.54 ⁵⁷	3.472 ³⁸	12.38 ⁸⁰
Dec. 6.1	4.457 ⁶⁶	56.83 ²⁷⁵	22.58 ²²	76.44 ³⁰⁴	44.169 ¹⁶	51.94 ⁶⁰	3.479 ⁷	13.31 ⁹³
16.0	4.447 ¹⁰	53.82 ³⁰¹	22.47 ¹¹	73.14 ³³⁰	44.239 ⁷⁰	51.36 ⁵⁸	3.590 ⁵¹	14.37 ¹⁰⁶
26.0	4.496 ⁴⁹	50.66 ³¹⁶	22.45 ²	69.65 ³⁴⁹	44.360 ¹²¹	50.82 ⁵⁴	3.625 ⁹⁵	15.53 ¹¹⁶
36.0	4.601 ¹⁰⁵	47.45 ³²¹	22.52 ⁷	68.12 ³⁵³	44.528 ¹⁶⁸	50.33 ⁴⁹	3.762 ¹³⁷	16.72 ¹¹⁹
Mean Place	3.849	49.53	25.151	68.30	40.823	52.34	0.847	16.45
Sec δ, Tan δ	1.348	+0.905	2.312	+2.084	1.153	-0.574	1.001	-0.051
Dψ α, Dω α	+0.04	0.00	+0.01	-0.01	+0.08	0.00	+0.06	0.00
Dψ δ, Dω δ	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♌ Sagittarii. Mag. 2.0		♐ Hercules. Mag. 3.9		♑ Telescopii. Mag. 3.8		♒ Draconis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 18	° ' " -34 25	h m 18 20	° ' " +21 43	h m 18 20	° ' " -46 0	h m 18 22	° ' " +72 41
Jan. 1.0	39.439	31.95	9.015	47.38	48.699	57.68	28.34	45.44
11.0	39.643	31.23	9.158	44.90	48.928	56.24	28.45	41.94
20.9	39.889	30.56	9.341	42.52	49.207	54.91	28.70	38.54
30.9	40.169	29.97	9.557	40.33	49.529	53.72	29.08	35.39
Feb. 9.9	40.477	29.45	9.801	38.40	49.886	52.66	29.57	32.61
19.9	40.806	29.00	10.068	36.83	50.268	51.76	30.17	30.30
Mar. 1.8	41.152	28.61	10.351	35.68	50.671	51.03	30.85	28.54
11.8	41.508	28.26	10.646	34.99	51.087	50.45	31.58	27.40
21.8	41.869	27.97	10.948	34.80	51.510	50.05	32.35	26.94
31.7	42.232	27.74	11.251	35.11	51.935	49.82	33.12	27.14
Apr. 10.7	42.591	27.56	11.551	35.89	52.356	49.74	33.87	27.99
20.7	42.942	27.44	11.843	37.12	52.768	49.85	34.58	29.46
30.7	43.281	27.40	12.122	38.75	53.163	50.14	35.23	31.49
May 10.6	43.602	27.44	12.381	40.69	53.538	50.59	35.79	33.99
20.6	43.899	27.58	12.617	42.93	53.884	51.23	36.26	36.87
30.6	44.166	27.83	12.825	45.33	54.194	52.03	36.62	40.07
June 9.6	44.398	28.17	13.000	47.84	54.463	52.97	36.86	43.45
19.5	44.591	28.61	13.138	50.41	54.685	54.04	36.97	46.94
29.5	44.739	29.14	13.236	52.93	54.853	55.23	36.96	50.44
July 9.5	44.838	29.74	13.292	55.36	54.964	56.47	36.83	53.85
19.4	44.888	30.38	13.304	57.65	55.016	57.73	36.58	57.10
29.4	44.887	31.04	13.273	59.72	55.008	58.98	36.19	60.11
Aug. 8.4	44.836	31.68	13.200	61.57	54.942	60.14	35.71	62.81
18.4	44.739	32.26	13.089	63.13	54.823	61.18	35.14	65.16
28.3	44.602	32.76	12.946	64.38	54.655	62.06	34.48	67.08
Sept. 7.3	44.432	33.14	12.774	65.33	54.449	62.72	33.76	68.55
17.3	44.239	33.36	12.585	65.93	54.216	63.13	33.00	69.53
27.3	44.035	33.42	12.386	66.17	53.967	63.26	32.20	70.00
Oct. 7.2	43.830	33.31	12.185	66.06	53.718	63.10	31.40	69.94
17.2	43.637	33.01	11.994	65.59	53.481	62.65	30.62	69.34
27.2	43.468	32.55	11.823	64.75	53.273	61.91	29.87	68.22
Nov. 6.1	43.333	31.95	11.678	63.57	53.104	60.92	29.18	66.58
16.1	43.242	31.22	11.569	62.05	52.985	59.71	28.57	64.45
26.1	43.201	30.42	11.501	60.24	52.923	58.35	28.07	61.89
Dec. 6.1	43.214	29.58	11.478	58.16	52.926	56.88	27.69	58.95
16.0	43.281	28.73	11.502	55.89	52.993	55.35	27.42	55.71
26.0	43.402	27.90	11.572	53.47	53.123	53.81	27.29	52.28
36.0	43.574	27.11	11.688	51.00	53.315	52.33	27.32	48.77
Mean Place	39.755	29.56	9.641	51.57	49.165	55.68	33.352	49.41
Sec δ , Tan δ	1.212	-0.685	1.076	+0.399	1.440	-1.036	3.362	+3.210
$D\psi\alpha$, $D_\alpha\alpha$	+0.08	0.00	+0.05	0.00	+0.09	+0.01	-0.02	-0.02
$D\psi\delta$, $D_\alpha\delta$	0.0	-1.0	0.0	-1.0	0.0	-1.0	0.0	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Sagittarii. Mag. 2.9		ϵ Serpentis. Mag. 5.4		ι Aquilæ. Mag. 4.1		ζ Pavonis. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 22	° ' " -25 28	h m 18 25	° ' " - 2 2	h m 18 30	° ' " - 8 18	h m 18 33	° ' " -71 29
	s 18 22	" -25 28	s 18 25	" - 2 2	s 18 30	" - 8 18	s 18 33	" -71 29
Jan. 1.0	50.642	10.44	21.467	27.25	41.128	14.28	18.54	65.91
11.0	50.826 184	10.24 20	21.623 156	28.46 121	41.285 157	15.10 82	18.91 37	63.14 277
20.9	51.049 223	10.08 16	21.815 192	29.65 119	41.476 191	15.91 81	19.39 48	60.51 263
30.9	51.303 254	9.94 14	22.035 220	30.74 109	41.698 222	16.67 76	19.98 59	58.09 242
Feb. 9.9	51.581 278	9.81 13	22.281 246	31.70 96	41.944 246	17.32 65	20.66 68	55.94 215
	302	14	263	76	267	51	74	185
19.9	51.883	9.67	22.544	32.46	42.211	17.83	21.40	54.09
Mar. 1.8	52.198 315	9.50 17	22.822 278	32.98 52	42.492 281	18.15 32	22.20 80	52.59 150
11.8	52.523 325	9.30 20	23.110 288	33.25 27	42.783 291	18.27 12	23.04 84	51.46 113
21.8	52.854 331	9.05 25	23.403 293	33.22 3	42.998 298	18.16 11	23.91 87	50.70 76
31.7	53.186 332	8.76 29	23.700 297	32.91 31	43.382 301	17.83 33	24.78 87	50.33 37
	330	33	295	61	300	54	86	0
Apr. 10.7	53.516	8.43	23.995	32.30	43.682	17.29	25.64	50.33
20.7	53.840 324	8.08 35	24.285 290	31.47 83	43.978 296	16.55 74	26.49 85	50.73 40
30.7	54.153 313	7.73 35	24.564 279	30.40 107	44.265 287	15.66 89	27.31 82	51.50 77
May 10.6	54.449 296	7.40 33	24.828 264	29.18 122	44.538 273	14.65 101	28.07 76	52.63 113
20.6	54.725 276	7.10 30	25.073 245	27.83 135	44.792 254	13.55 110	28.77 70	54.08 145
	250	24	220	143	231	114	61	175
30.6	54.975	6.86	25.293	26.40	45.023	12.41	29.38	55.83
June 9.6	55.193 218	6.68 18	25.485 192	24.95 145	45.225 202	11.28 113	29.90 52	57.83 200
19.5	55.375 182	6.59 9	25.645 160	23.51 144	45.394 169	10.17 111	30.32 42	60.04 221
29.5	55.518 143	6.58 1	25.767 122	22.12 139	45.526 132	9.13 104	30.63 31	62.39 235
July 9.5	55.617 99	6.66 8	25.850 83	20.86 126	45.619 98	8.18 95	30.81 18	64.82 243
	51	13	41	119	50	85	6	243
19.4	55.668	6.79	25.891	19.67	45.669	7.33	30.87	67.25
29.4	55.672 4	6.98 19	25.890 1	18.62 105	45.676 7	6.61 72	30.81 6	69.62 237
Aug. 8.4	55.632 40	7.20 22	25.847 43	17.73 89	45.641 35	6.01 60	30.62 19	71.82 220
18.4	55.549 83	7.43 23	25.768 79	16.98 75	45.567 74	5.52 49	30.30 32	73.80 198
28.3	55.428 121	7.65 22	25.654 114	16.40 58	45.458 109	5.15 37	29.90 40	75.47 167
	151	17	141	44	136	25	49	129
Sept. 7.3	55.277	7.82	25.513	15.96	45.322	4.90	29.41	76.76
17.3	55.102 175	7.94 12	25.353 160	15.69 27	45.163 159	4.74 16	28.86 55	77.61 85
27.3	54.917 185	7.99 5	25.183 170	15.56 13	44.993 170	4.68 6	28.27 59	77.99 38
Oct. 7.2	54.731 186	7.95 4	25.010 173	15.60 4	44.821 172	4.71 3	27.66 61	77.87 12
17.2	54.555 176	7.82 13	24.847 163	15.78 18	44.658 163	4.82 11	27.08 58	77.23 64
	154	22	146	34	147	22	54	114
27.2	54.401	7.60	24.701	16.12	44.511	5.04	26.54	76.09
Nov. 6.1	54.277 124	7.33 27	24.583 118	16.63 51	44.392 119	5.35 31	26.07 47	74.48 161
16.1	54.192 85	7.01 32	24.499 84	17.28 65	44.307 85	5.76 41	25.70 37	72.47 201
26.1	54.152 40	6.67 34	24.457 42	18.09 81	44.261 46	6.27 51	25.46 13	70.13 234
Dec. 6.1	54.162 10	6.34 33	24.457 0	19.03 94	44.260 1	6.88 61	25.33 24	67.51 262
	60	32	43	107	43	71	1	277
16.0	54.222	6.02	24.500	20.10	44.303	7.59	25.34	64.74
26.0	54.331 100	5.74 28	24.588 88	21.25 115	44.390 87	8.36 77	25.48 14	61.89 285
36.0	54.486 155	5.51 23	24.717 129	22.46 121	44.520 130	9.17 81	25.77 29	59.06 283
Mean Place	50.911	7.64	21.795	23.78	41.420	11.05	20.434	64.20
Sec δ , Tan δ	1.108	-0.476	1.001	-0.036	1.011	-0.146	3.152	-2.989
$D\psi\alpha$, $D\omega\alpha$	+0.07	0.00	+0.06	0.00	+0.06	0.00	+0.14	+0.03
$D\psi\delta$, $D\omega\delta$	0.0	-1.0	0.0	-1.0	+0.1	-1.0	+0.1	-1.0

39398° -1917—-30

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Lyrae. (Vega.) Mag. 0.1		β Aquilae. Mag. 4.7		ϕ Sagittarii. Mag. 3.3		110 Herculis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 34	° ' " +38 42	h m 18 37	° ' " - 9 7	h m 18 40	° ' " -27 4	h m 18 42	° ' " +20 27
	s "	s "	s "	s "	s "	s "	s "	s "
Jan. 1.0	6.597	17.40	43.529	61.76	27.989	40.73	4.710	54.69
11.0	6.713 ¹¹⁶	14.34 ³⁰⁶	43.680 ¹⁵¹	62.51 ⁷⁵	28.157 ¹⁶⁸	40.34 ³⁹	4.832 ¹²²	52.33 ²⁸⁶
20.9	6.879 ¹⁶⁶	11.36 ²⁹⁸	43.865 ¹⁸⁵	63.24 ⁷³	28.365 ²⁰⁸	39.98 ³⁶	4.993 ¹⁶¹	50.02 ²³¹
30.9	7.088 ²⁰⁹	8.59 ²⁷⁷	44.082 ²¹⁷	63.90 ⁶⁶	28.605 ²⁴⁰	39.64 ³⁴	5.187 ¹⁹⁴	47.88 ²¹⁴
Feb. 9.9	7.336 ²⁴⁸	6.14 ²⁴⁵	44.323 ²⁴¹	64.48 ⁵⁸	28.875 ²⁷⁰	39.30 ³⁴	5.413 ²²⁶	45.98 ¹⁹⁰
19.9	7.616 ²⁸⁰	4.09 ²⁰⁵	44.586 ²⁶³	64.92 ⁴⁴	29.166 ²⁹¹	38.96 ³⁴	5.664 ²⁵¹	44.40 ¹⁵⁸
Mar. 1.8	7.922 ³⁰⁶	2.54 ¹⁵⁵	44.864 ²⁷⁸	65.17 ²⁵	29.476 ³¹⁰	38.60 ³⁶	5.933 ²⁶⁹	43.22 ¹¹⁸
11.8	8.246 ³²⁴	1.54 ¹⁰⁰	45.154 ²⁹⁰	65.23 ⁶	29.798 ³²²	38.22 ³⁸	6.218 ²⁸⁵	42.48 ⁷⁴
21.8	8.582 ³³⁶	1.14 ⁴⁰	45.451 ²⁹⁷	65.07 ¹⁶	30.130 ³³²	37.80 ⁴²	6.514 ²⁹⁶	42.21 ²⁷
31.8	8.924 ³⁴²	1.34 ²⁰	45.753 ³⁰²	64.71 ³⁶	30.466 ³³⁶	37.35 ⁴⁵	6.815 ³⁰¹	42.43 ²²
	339	79	302	57	336	46	301	70
Apr. 10.7	9.263	2.13	46.055	64.14	30.802	36.89	7.116	43.13
20.7	9.594 ³³¹	3.47 ¹³⁴	46.353 ²⁹⁸	63.38 ⁷⁶	31.135 ³³³	36.42 ⁴⁷	7.413 ²⁹⁷	44.28 ¹¹⁵
30.7	9.909 ³¹⁵	5.31 ¹⁸⁴	46.644 ²⁹¹	62.47 ⁹¹	31.461 ³²⁶	35.97 ⁴⁵	7.701 ²⁸⁸	45.82 ¹⁵⁴
May 10.6	10.201 ²⁹²	7.59 ²²⁸	46.922 ²⁷⁸	61.45 ¹⁰²	31.771 ³¹⁰	35.56 ⁴¹	7.974 ²⁷³	47.69 ¹⁶⁷
20.6	10.464 ²⁶³	10.22 ²⁶³	47.181 ²⁵⁹	60.35 ¹¹⁰	32.063 ²⁹²	35.20 ³⁶	8.225 ²⁵¹	49.85 ²¹⁶
	229	289	237	113	268	28	227	236
30.6	10.693 ¹⁹⁰	13.11 ³⁰⁸	47.418 ²⁰⁹	59.22 ¹¹³	32.331 ²³⁸	34.92 ¹⁸	8.452 ¹⁹⁴	52.21 ²⁴⁸
June 9.6	10.883 ¹⁴⁴	16.19 ³¹⁶	47.627 ¹⁷⁷	58.09 ¹¹⁰	32.569 ²⁰¹	34.74 ⁹	8.646 ¹⁵⁹	54.69 ²⁵⁴
19.5	11.027 ⁹⁷	19.35 ³¹⁷	47.804 ¹³⁹	56.99 ¹⁰²	32.770 ¹⁶¹	34.65 ²	8.805 ¹²⁰	57.23 ²⁵³
29.5	11.124 ⁴⁶	22.52 ³⁰⁹	47.943 ¹⁰⁰	55.97 ⁹³	32.931 ¹¹⁶	34.67 ¹¹	8.925 ⁷⁸	59.76 ²⁴⁵
July 9.5	11.170 ⁴	25.61 ²⁹⁴	48.043 ⁵⁷	55.04 ⁸²	33.047 ⁶⁹	34.78 ²¹	9.003 ³⁴	62.21 ²³³
19.5	11.166 ⁵⁴	28.55 ²⁷⁴	48.100 ¹⁴	54.22 ⁷⁰	33.116 ²²	34.99 ²⁷	9.037 ¹⁰	64.53 ²¹³
29.4	11.112 ¹⁰²	31.29 ²⁴⁶	48.114 ²⁹	53.52 ⁵⁹	33.138 ²⁶	35.26 ³¹	9.027 ⁵³	66.66 ¹⁹²
Aug. 8.4	11.010 ¹⁴⁷	33.75 ²¹³	48.085 ⁶⁹	52.93 ⁴⁶	33.142 ⁷¹	35.57 ³⁴	8.974 ⁹²	68.58 ¹⁶⁵
18.4	10.863 ¹⁸⁴	35.88 ¹⁷⁸	48.016 ¹⁰⁵	52.47 ³⁵	33.041 ¹¹¹	35.91 ²⁸	8.882 ¹²⁹	70.23 ¹³⁷
28.3	10.679 ²¹⁸	37.66 ¹³⁷	47.911 ¹³³	52.12 ²⁴	32.930 ¹⁴⁴	36.24 ²³	8.753 ¹⁵⁸	71.60 ¹⁰⁶
Sept. 7.3	10.461	39.03	47.778	51.88	32.786	36.52	8.595	72.65
17.3	10.221 ²⁴⁰	39.98 ⁹⁵	47.623 ¹⁵⁵	51.73 ¹⁵	32.615 ¹⁷¹	36.74 ²²	8.415 ¹⁸⁰	73.37 ⁷³
27.3	9.967 ²⁵⁴	40.48 ⁵⁰	47.453 ¹⁷⁰	51.67 ⁶	32.430 ¹⁸⁵	36.88 ¹⁴	8.221 ¹⁹⁴	73.76 ³⁹
Oct. 7.2	9.709 ²⁵⁸	40.52 ⁴	47.281 ¹⁷²	51.70 ³	32.241 ¹⁸⁹	36.92 ⁴	8.023 ¹⁹⁸	73.81 ⁵
17.2	9.458 ²⁵¹	40.09 ⁴³	47.116 ¹⁶⁵	51.80 ¹⁰	32.059 ¹⁸²	36.85 ⁷	7.831 ¹⁹²	73.49 ³²
	233	89	149	19	164	17	177	66
27.2	9.225	39.20	46.967	51.99	31.895	36.68	7.654	72.83
Nov. 6.2	9.020 ²⁰⁵	37.85 ¹³⁵	46.845 ¹²²	52.27 ²⁸	31.758 ¹³⁷	36.41 ²⁷	7.501 ¹⁵³	71.82 ¹⁰¹
16.1	8.851 ¹⁶⁹	36.06 ¹⁷⁹	46.755 ⁹⁰	52.64 ³⁷	31.659 ⁹⁹	36.07 ³⁴	7.381 ¹²⁰	70.48 ¹³⁴
26.1	8.725 ¹²⁶	33.88 ²¹⁸	46.705 ⁵⁰	53.10 ⁴⁶	31.604 ⁵⁵	35.68 ³⁹	7.299 ⁸²	68.84 ¹⁶⁴
Dec. 6.1	8.649 ⁷⁶	31.37 ²⁵¹	46.698 ⁷	53.64 ⁵⁴	31.596 ⁸	35.26 ⁴²	7.259 ⁴⁰	66.94 ¹⁹⁰
	24	278	37	62	42	43	4	213
16.0	8.625	28.59	46.735	54.26	31.638	34.83	7.263	64.81
26.0	8.654 ²⁹	25.62 ²⁹⁷	46.816 ⁸¹	54.96 ⁷⁰	31.729 ⁹¹	34.40 ⁴³	7.313 ⁵⁰	62.53 ²²⁸
36.0	8.737 ⁸³	22.56 ³⁰⁶	46.940 ¹²⁴	55.70 ⁷⁴	31.866 ¹³⁷	34.00 ⁴⁰	7.405 ⁹²	60.18 ²³⁵
Mean Place	7.695	20.61	43.817	58.66	28.264	37.80	5.321	57.52
Sec δ , Tan δ	1.281	+0.801	1.013	-0.161	1.123	-0.511	1.067	+0.373
D ψ α , D ω α	+0.04	-0.01	+0.07	0.00	+0.07	+0.01	+0.05	0.00
D ψ δ , D ω δ	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	6 Aquilæ. Mag. 4.5		λ Pavonis. Mag. 4.4		β Lyrae. Var. 3.4-4.1		50 Draconis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 42	° ' " - 4 50	h m 18 44	° ' " -62 16	h m 18 47	° ' " +33 15	h m 18 48	° ' " +75 19
	s	"	s	"	s	"	s	"
Jan. 1.0	45.920	18.58	30.77	65.56	0.001	53.87	57.44	70.27
11.0	46.062 ¹⁴²	19.56 ⁹⁸	31.02 ²⁵	63.13 ²⁴³	0.107 ¹⁰⁶	51.01 ²⁸⁶	57.44 ⁰	66.83 ³⁴⁴
21.0	46.239 ¹⁷⁷	20.53 ⁹⁷	31.36 ³⁴	60.81 ²³²	0.258 ¹⁵¹	48.20 ²⁸¹	57.61 ¹⁷	63.42 ³⁴¹
30.9	46.447 ²⁰⁸	21.42 ⁸⁹	31.76 ⁴⁰	58.65 ²¹⁶	0.449 ¹⁹¹	45.58 ²⁶²	57.95 ³⁴	60.19 ³²³
Feb. 9.9	46.680 ²³³	22.18 ⁷⁶	32.22 ⁴⁶	56.68 ¹⁹⁷	0.677 ²²⁸	43.23 ²³⁵	58.43 ⁴⁸	57.26 ²⁹⁸
	255	60	51	172	289	197	61	253
19.9	46.935	22.78	32.73	54.96	0.936	41.26	59.04	54.73
Mar. 1.8	47.206 ²⁷¹	23.17 ³⁹	33.29 ⁵⁶	53.49 ¹⁴⁷	1.220 ²⁸⁴	39.74 ¹⁵²	59.76 ⁷²	52.70 ²⁰⁸
11.8	47.490 ²⁸⁴	23.31 ¹⁴	33.87 ⁵⁸	52.32 ¹¹⁷	1.524 ³⁰⁴	38.73 ¹⁰¹	60.56 ⁸⁰	51.26 ¹⁴⁴
21.8	47.782 ²⁹²	23.21 ¹⁰	34.47 ⁰⁰	51.44 ⁸⁸	1.840 ³¹⁶	38.29 ⁴⁴	61.43 ⁸⁷	50.45 ⁸¹
31.8	48.079 ²⁹⁷	22.84 ³⁷	35.08 ⁶¹	50.89 ⁵⁵	2.163 ³²³	38.42 ¹³	62.32 ⁸⁹	50.30 ¹⁵
	298	62	61	24	325	68	89	52
Apr. 10.7	48.377	22.22	35.69	50.65	2.488	39.10	63.21	50.82
20.7	48.673 ²⁹⁶	21.38 ⁸⁴	36.29 ⁶⁰	50.73 ⁸	2.808 ³²⁰	40.32 ¹²²	64.05 ⁸⁴	51.96 ¹¹⁴
30.7	48.961 ²⁸⁸	20.35 ¹⁰³	36.87 ⁵⁸	51.13 ⁴⁰	3.115 ³⁰⁷	42.02 ¹⁷⁰	64.85 ⁸⁰	53.69 ¹⁷³
May 10.7	49.237 ²⁷⁶	19.16 ¹¹⁹	37.42 ⁵⁵	51.85 ⁷²	3.406 ²⁹¹	44.15 ²¹³	65.56 ⁷¹	55.93 ²²⁴
20.6	49.495 ²⁵⁸	17.87 ¹²⁹	37.93 ⁶¹	52.85 ¹⁰⁰	3.671 ²⁶⁵	46.62 ²⁴⁷	66.16 ⁶⁰	58.62 ²⁶⁹
	286	135	46	180	237	272	49	305
30.6	49.731	16.52	38.39	54.15	3.908	49.34	66.65	61.67
June 9.6	49.940 ²⁰⁹	15.16 ¹³⁶	38.80 ⁴¹	55.69 ¹⁵⁴	4.108 ²⁰⁰	52.25 ²⁹¹	67.00 ³⁵	64.97 ³³⁰
19.5	50.116 ¹⁷⁶	13.81 ¹³⁵	39.14 ³⁴	57.43 ¹⁷⁴	4.268 ¹⁶⁰	55.26 ³⁰¹	67.21 ²¹	68.43 ³⁴⁶
29.5	50.257 ¹⁴¹	12.53 ¹²⁸	39.39 ²⁵	59.33 ¹⁹⁰	4.384 ¹¹⁶	58.29 ³⁰³	67.28 ⁷	71.97 ³⁵⁴
July 9.5	50.357 ⁵⁸	11.35 ¹¹⁸	39.57 ⁸	61.34 ²⁰¹	4.453 ⁶⁹	61.25 ²⁹⁶	67.18 ¹⁰	75.48 ³⁵¹
	16	108	8	206	21	284	23	341
19.5	50.415	10.27	39.65 ⁷	63.39 ²⁰⁴	4.474 ²⁸	64.09 ²⁶⁴	66.95 ³⁷	78.89 ³²⁸
29.4	50.431 ²⁶	9.33 ⁸⁰	39.65 ⁰	65.43 ¹⁹⁴	4.446 ⁷⁴	66.73 ²⁴⁰	66.58 ⁵⁰	82.12 ²⁹⁷
Aug. 8.4	50.405 ⁶⁷	8.53 ⁶⁵	39.56 ¹⁷	67.37 ¹⁷⁷	4.372 ¹¹⁸	69.13 ²⁰⁰	66.08 ⁶³	85.09 ²⁶⁶
18.4	50.338 ¹⁰²	7.88 ⁵²	39.39 ²⁴	69.14 ¹⁵³	4.254 ¹⁵⁷	71.22 ¹⁷⁶	65.45 ⁷³	87.75 ²²⁸
28.4	50.236 ¹³²	7.36 ³⁷	39.15 ³⁰	70.67 ¹²²	4.097 ¹⁸⁸	72.98 ¹³⁹	64.72 ⁸²	90.03 ¹⁸⁷
Sept. 7.3	50.104 ¹⁵³	6.99 ²³	38.85 ³⁶	71.89 ⁸⁷	3.909 ²¹⁴	74.37 ⁹⁹	63.90 ⁸⁸	91.90 ¹⁴¹
17.3	49.951 ¹⁶⁸	6.76 ¹⁰	38.49 ³⁹	72.76 ⁴⁸	3.695 ²²⁸	75.36 ⁵⁸	63.02 ⁹²	93.31 ⁹⁰
27.3	49.783 ¹⁷³	6.66 ²	38.10 ⁴⁰	73.24 ³	3.467 ²⁸⁴	75.94 ¹⁴	62.10 ⁹⁵	94.21 ³⁹
Oct. 7.2	49.610 ¹⁶⁵	6.68 ²⁸	37.70 ³⁵	73.27 ⁸⁵	3.233 ²¹⁴	76.08 ⁷⁸	61.15 ⁹¹	94.60 ⁶⁸
17.2	49.445 ¹⁵¹	6.82 ¹⁴	37.32 ³⁸	72.86 ⁴¹	3.004 ²²⁹	75.79 ²⁹	60.20 ⁹⁵	94.46 ¹⁴
	161	28	35	85	214	78	91	68
27.2	49.294 ¹²⁵	7.10 ⁴⁰	36.97 ³¹	72.01 ¹²⁷	2.790 ¹⁹⁰	75.06 ¹¹⁷	59.29 ⁸⁶	93.78 ¹²¹
Nov. 6.2	49.169 ⁹⁴	7.50 ⁵²	36.66 ²⁵	70.74 ¹⁶³	2.600 ¹⁵⁷	73.89 ¹⁶⁷	58.43 ⁷⁹	92.57 ¹⁷⁸
16.1	49.075 ⁵⁵	8.02 ⁶⁴	36.41 ¹⁷	69.11 ¹⁹⁴	2.443 ¹¹⁷	72.32 ¹⁹⁶	57.64 ⁶⁹	90.84 ²²¹
26.1	49.020 ¹⁴	8.66 ⁷⁶	36.24 ⁸	67.17 ²¹⁹	2.326 ⁷³	70.36 ²²⁸	56.95 ⁵⁵	88.63 ²⁶⁴
Dec. 6.1	49.006 ³⁰	9.42 ⁸⁶	36.16 ¹	64.98 ²³⁵	2.253 ²⁴	68.08 ²⁵⁶	56.40 ⁴²	85.99 ³⁰⁰
	74	93	11	244	25	274	27	325
16.1	49.036	10.28	36.17	62.63	2.229	65.52	55.98	82.99
26.0	49.110 ¹¹⁴	11.21 ⁹⁶	36.28 ²⁰	60.19 ²⁴⁶	2.254 ⁷⁴	62.78 ²⁸⁵	55.71 ⁹	79.74 ³⁴¹
36.0	49.224	12.17	36.48	57.73	2.328	59.93	55.62	76.33
Mean Place	46.231	15.57	31.787	63.04	0.919	56.11	63.584	71.11
Sec δ, Tan δ	1.004	-0.085	2.150	-1.903	1.196	+0.656	3.950	+3.821
Dψ α, Dω α	+0.06	0.00	+0.11	+0.02	+0.04	-0.01	-0.04	-0.05
Dψ δ, Dω δ	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♌ Draconis. Mag. 4.8		♐ Sagittarii. Mag. 2.1		♏ Serpentis pr. Mag. 4.5		♋ Lyrae. Var. 4.0-4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 49 s	° ' " +59 16 "	h m 18 50 s	° ' " -26 23 "	h m 18 52 s	° ' " + 4 5 "	h m 18 52 s	° ' " +43 49 "
Jan. 1.0	56.294	70.53	6.845	66.68	5.201	38.14	47.268	68.76
11.0	56.361 ⁶⁷	67.08 ³⁴⁵	7.001 ¹⁵⁶	66.31 ³⁷	5.327 ¹²⁶	36.66 ¹⁴⁸	47.356 ⁸⁸	65.59 ³¹⁷
21.0	56.508 ¹⁴⁷	63.69 ³³⁹	7.197 ¹⁹⁶	65.94 ³⁷	5.488 ¹⁶¹	35.21 ¹⁴⁵	47.497 ¹⁴¹	62.48 ³¹¹
30.9	56.729 ²²¹	60.48 ³²¹	7.426 ²²⁹	65.59 ³⁵	5.680 ¹⁹²	33.87 ¹³⁴	47.688 ¹⁹¹	59.54 ²⁹⁴
Feb. 9.9	57.019 ²⁹⁰	57.58 ²⁹⁰	7.686 ²⁶⁰	65.22 ³⁷	5.900 ²²⁰	32.70 ¹¹⁷	47.925 ²³⁷	56.89 ²⁶⁵
	349	248	282	37	242	96	275	226
19.9	57.368	55.10	7.968	64.85	6.142	31.74	48.200	54.63
Mar. 1.8	57.767	53.13	8.269	64.44	6.403	31.07	48.508	52.86
11.8	58.205 ⁴³⁸	51.76 ¹³⁷	8.585 ³¹⁶	63.99 ⁴⁵	6.678 ²⁷⁵	30.72 ³⁵	48.840 ³³²	51.64 ¹²²
21.8	58.668 ⁴⁶³	51.02 ⁷⁴	8.911 ³²⁶	63.50 ⁴⁹	6.964 ²⁸⁶	30.70 ²	49.191 ³⁵¹	51.02 ⁶²
31.8	59.144 ⁴⁷⁶	50.95 ⁷	9.244 ³³³	62.97 ⁵³	7.256 ²⁹²	31.03 ³³	49.551 ³⁶⁰	51.03 ¹
	477	58	335	55	295	67	362	62
Apr. 10.7	59.621	51.53	9.579	62.42	7.551	31.70	49.913	51.65
20.7	60.086 ⁴⁶⁵	52.75 ¹²²	9.912 ³³³	61.87 ⁵⁵	7.844 ²⁹³	32.67 ⁹⁷	50.269 ³⁵⁶	52.85 ¹²⁰
30.7	60.525 ⁴³⁹	54.54 ¹⁷⁹	10.239 ³²⁷	61.32 ⁵⁵	8.131 ²⁸⁷	33.92 ¹²⁵	50.612 ³⁴³	54.59 ¹⁷⁴
May 10.7	60.928 ⁴⁰³	56.85 ²³¹	10.554 ³¹⁵	60.81 ⁵¹	8.407 ²⁷⁶	35.39 ¹⁴⁷	50.933 ³²¹	56.82 ²²³
20.6	61.286 ³⁵⁸	59.60 ²⁷⁵	10.851 ²⁹⁷	60.37 ⁴⁴	8.665 ²⁵⁸	37.04 ¹⁶⁵	51.224 ²⁹¹	59.42 ²⁹⁰
	302	309	274	38	238	176	255	294
30.6	61.588	62.69	11.125	59.99	8.903	38.80	51.479	62.36
June 9.6	61.827 ²³⁹	66.02 ³³³	11.369 ²⁴⁴	59.72 ²⁷	9.112 ²⁰⁹	40.62 ¹⁸²	51.693 ²¹⁴	65.51 ³¹⁵
19.5	61.998 ¹⁷¹	69.52 ³⁵⁰	11.578 ²⁰⁹	59.55 ¹⁷	9.290 ¹⁷⁸	42.45 ¹⁸³	51.859 ¹⁶⁶	68.80 ³²⁹
29.5	62.096 ⁹⁸	73.07 ³⁵⁵	11.747 ¹⁶⁹	59.49 ⁶	9.432 ¹⁴²	44.24 ¹⁷⁹	51.975 ¹¹⁶	72.12 ³³²
July 9.5	62.119 ²³	76.58 ³⁵¹	11.872 ¹²⁵	59.55 ⁶	9.533 ¹⁰¹	45.95 ¹⁷¹	52.036 ⁶¹	75.41 ³³⁹
	53	341	79	15	60	157	6	317
19.5	62.066	79.99	11.951	59.70	9.593	47.52	52.042	78.58
29.4	61.940 ¹²⁶	83.20 ³²¹	11.981 ³⁰	59.93 ²³	9.610 ¹⁷	48.96 ¹⁴⁴	51.993 ⁴⁹	81.55 ²⁹⁷
Aug. 8.4	61.743 ¹⁹⁷	86.15 ²⁹⁵	11.963 ¹⁸	60.22 ²⁹	9.585 ²⁵	50.21 ¹²⁵	51.892 ¹⁰¹	84.27 ²⁷²
18.4	61.483 ²⁶⁰	88.76 ²⁶¹	11.899 ⁶⁴	60.55 ²³	9.519 ⁶⁶	51.27 ¹⁰⁶	51.742 ¹⁵⁰	86.68 ²⁴¹
28.4	61.166 ³¹⁷	91.00 ²²⁴	11.795 ¹⁰⁴	60.88 ³³	9.418 ¹⁰¹	52.14 ⁸⁷	51.548 ¹⁹⁴	88.72 ²⁰⁴
	364	181	138	30	132	66	230	165
Sept. 7.3	60.802	92.81	11.657	61.18	9.236	52.80	51.318	90.37
17.3	60.401 ⁴⁰¹	94.15 ¹³⁴	11.491 ¹⁶⁶	61.44 ²⁶	9.132 ¹⁵⁴	53.25 ⁴⁵	51.059 ²⁶⁹	91.58 ¹²¹
27.3	59.978 ⁴²³	95.00 ⁸⁵	11.308 ¹⁸³	61.62 ¹⁸	8.962 ¹⁷⁰	53.48 ²³	50.782 ²⁷⁷	92.33 ⁷⁵
Oct. 7.2	59.543 ⁴³⁵	95.33 ³⁸	11.120 ¹⁸⁸	61.71 ⁹	8.787 ¹⁷⁵	53.51 ³	50.498 ²⁸⁴	92.60 ²⁷
17.2	59.112 ⁴³¹	95.12 ²¹	10.936 ¹⁸⁴	61.70 ¹	8.617 ¹⁷⁰	53.32 ¹⁹	50.217 ²⁸¹	92.38 ²³
	414	75	166	11	156	39	268	71
27.2	58.698	94.37	10.770	61.59	8.461 ¹³⁴	52.93	49.951	91.67
Nov. 6.2	58.317 ³⁸¹	93.09 ¹²⁸	10.630 ¹⁴⁰	61.39 ²⁰	8.327 ¹⁰³	52.34 ⁵⁹	49.709 ²⁴²	90.47 ¹²⁰
16.1	57.980 ³³⁷	91.30 ¹⁷⁹	10.526 ¹⁰⁴	61.10 ²⁹	8.224 ⁶⁸	51.53 ⁸¹	49.502 ²⁰⁷	88.80 ¹⁶⁷
26.1	57.699 ²⁸¹	89.04 ²²⁶	10.463 ⁶³	60.76 ³⁴	8.156 ²⁷	50.54 ⁹⁹	49.338 ¹⁰⁴	86.70 ²¹⁰
Dec. 6.1	57.483 ²¹⁶	86.36 ²⁶⁸	10.446 ¹⁷	60.38 ³⁸	8.129 ¹⁵	49.37 ¹¹⁷	49.223 ¹¹⁵	84.22 ²⁴⁸
	143	303	32	39	15	131	61	278
16.1	57.340	83.33	10.478	59.99	8.144	48.06	49.162	81.44
26.0	57.276 ⁶⁴	80.06 ³²⁷	10.558 ⁸⁰	59.60 ³⁹	8.202 ⁵⁸	46.65 ¹⁴¹	49.156 ⁶	78.42 ³⁰²
36.0	57.292 ¹⁶	76.65 ³⁴¹	10.684 ¹²⁶	59.21 ³⁹	8.299 ⁹⁷	45.18 ¹⁴⁷	49.208 ⁵²	75.27 ³¹⁵
Mean Place	58.730	71.75	7.114	63.66	5.582	40.76	48.588	70.20
Sec δ, Tan δ	1.958	+1.683	1.116	-0.496	1.003	+0.072	1.386	+0.960
D _ψ α, D _ω α	+0.02	-0.02	+0.07	+0.01	+0.06	0.00	+0.04	-0.01
D _ψ δ, D _ω δ	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Lyrae. Mag. 3.3		ε Aquilae. Mag. 4.2		ζ Sagittarii. Mag. 2.7		ζ Aquilae. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 55	° ' " +32 34	h m 18 55	° ' " +14 57	h m 18 57	° ' " -29 59	h m 19 1	° ' " +13 44
Jan. 1.0	49.401	28.17	50.786	14.57	19.607	63.39	35.204	19.23
11.0	49.498 97	25.35 282	50.900 114	12.52 205	19.760 153	62.76 63	35.312 108	17.25 198
21.0	49.639 141	22.58 277	51.060 150	10.51 201	19.953 193	62.14 62	35.457 145	15.32 193
30.9	49.821 182	19.98 260	51.233 183	8.63 188	20.182 229	61.53 61	35.636 179	13.50 182
Feb. 9.9	50.040 219	17.63 235	51.447 214	6.97 166	20.443 261	60.94 59	35.845 209	11.88 162
19.9	50.291 251	15.64 199	51.684 237	5.57 140	20.728 285	60.34 60	36.078 233	10.53 135
Mar. 1.8	50.567 276	14.09 155	51.943 259	4.54 108	21.034 306	59.74 60	36.333 255	9.53 100
11.8	50.865 298	13.06 104	52.218 275	3.91 63	21.356 322	59.13 61	36.605 272	8.92 61
21.8	51.177 312	12.57 48	52.505 287	3.70 21	21.690 334	58.52 61	36.889 284	8.72 20
31.8	51.497 320	12.64 7	52.799 294	3.92 22	22.033 343	57.91 61	37.182 293	8.95 23
Apr. 10.7	51.821 324	13.27 63	53.096 297	4.58 66	22.378 345	57.32 59	37.479 297	9.60 65
20.7	52.142 321	14.43 116	53.391 295	5.64 106	22.722 344	56.76 56	37.775 296	10.65 106
30.7	52.452 310	16.07 164	53.680 289	7.06 142	23.061 339	56.24 52	38.066 291	12.04 139
May 10.7	52.747 295	18.14 207	53.957 277	8.80 174	23.389 328	55.79 45	38.346 280	13.75 171
20.6	53.020 273	20.56 242	54.216 259	10.79 199	23.698 309	55.43 36	38.608 262	15.70 195
30.6	53.283 243	23.26 270	54.452 236	12.97 218	23.986 286	55.18 25	38.850 242	17.84 214
June 9.6	53.471 208	26.14 288	54.659 207	15.26 229	24.243 257	55.04 14	39.063 213	20.09 225
19.5	53.641 170	29.13 299	54.834 175	17.60 264	24.465 222	55.03 1	39.243 180	22.38 229
29.5	53.767 126	32.15 302	54.972 138	19.93 283	24.646 181	55.15 12	39.387 144	24.67 229
July 9.5	53.846 79	35.13 298	55.069 97	22.19 226	24.783 137	55.40 25	39.489 102	26.88 221
19.5	53.878 32	37.98 285	55.122 53	24.31 212	24.871 88	55.74 34	39.549 60	28.97 209
29.4	53.861 17	40.64 266	55.132 10	26.28 197	24.910 39	56.16 42	39.565 16	30.90 193
Aug. 8.4	53.797 64	43.07 243	55.098 34	28.04 176	24.897 13	56.64 48	39.538 27	32.62 172
18.4	53.689 108	45.21 214	55.024 74	29.56 152	24.837 60	57.15 51	39.470 68	34.13 151
28.4	53.541 148	47.03 182	54.913 111	30.82 126	24.734 103	57.65 50	39.365 105	35.38 125
Sept. 7.3	53.360 181	48.48 145	54.773 140	31.82 100	24.595 139	58.10 45	39.229 136	36.37 99
17.3	53.153 207	49.54 106	54.607 166	32.52 70	24.426 199	58.47 37	39.067 162	37.07 70
27.3	52.930 223	50.19 65	54.427 180	32.93 41	24.239 187	58.73 26	38.891 176	37.49 42
Oct. 7.2	52.700 230	50.42 23	54.240 187	33.03 10	24.045 194	58.87 14	38.707 184	37.61 12
17.2	52.473 227	50.21 21	54.057 183	32.82 21	23.854 191	58.88 1	38.525 182	37.43 18
27.2	52.260 213	49.56 65	53.888 169	32.31 51	23.679 175	58.74 14	38.357 168	36.97 46
Nov. 6.2	52.068 192	48.49 107	53.739 149	31.49 82	23.529 150	58.46 28	38.208 149	36.21 76
16.1	51.909 159	47.01 148	53.621 118	30.39 110	23.415 114	58.07 39	38.089 119	35.16 105
26.1	51.787 122	45.15 186	53.537 84	29.02 137	23.343 72	57.59 48	38.005 84	33.86 130
Dec. 6.1	51.709 78	42.95 220	53.495 2	27.41 161	23.316 27	57.03 56	37.959 46	32.33 153
16.1	51.677 32	40.46 249	53.494 1	25.60 181	23.341 25	56.43 60	37.955 4	30.59 174
26.0	51.694 17	37.78 268	53.537 43	23.64 196	23.414 73	55.80 63	37.994 39	28.71 188
36.0	51.760 66	34.99 279	53.622 85	21.61 203	23.536 122	55.17 63	38.075 81	26.75 196
Mean Place	50.298	29.74	51.301	16.73	19.884	60.26	35.698	21.13
Sec δ, Tan δ	1.187	+0.639	1.035	+0.267	1.155	-0.577	1.029	+0.245
Dψ α, Dω α	+0.04	-0.01	+0.05	0.00	+0.08	+0.01	+0.05	0.00
Dψ δ, Dω δ	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Aquilæ. Mag. 3.6			α Coronæ Australis. Mag. 4.1			ϵ Lyrae. Mag. 5.1			π Sagittarii. Mag. 3.0		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 19 1	° ' " - 5 0		h m 19 3	° ' " - 38 1		h m 19 4	° ' " + 35 57		h m 19 4	° ' " - 21 9	
Jan. 1.0	50.348	30.77		49.226	69.70		19.421	68.82		49.462	26.64	
11.0	50.472	31.69		49.381	68.55		19.503	65.91		49.597	26.54	
21.0	50.631	32.59		49.583	67.42		19.635	63.04		49.770	26.44	
30.9	50.821	33.41		49.825	66.32		19.809	60.31		49.976	26.31	
Feb. 9.9	51.039	34.10		50.100	65.26		20.022	57.85		50.211	26.13	
19.9	51.279	34.64		50.406	64.26		20.270	55.75		50.472	25.89	
Mar. 1.9	51.540	34.96		50.735	63.31		20.547	54.08		50.751	25.57	
11.8	51.815	35.05		51.084	62.43		20.847	52.92		51.046	25.16	
21.8	52.101	34.88		51.446	61.62		21.164	52.31		51.355	24.66	
31.8	52.396	34.46		51.818	60.90		21.493	52.30		51.672	24.06	
Apr. 10.7	52.695	33.78		52.195	60.26		21.826	52.85		51.994	23.37	
20.7	52.994	32.89		52.572	59.74		22.156	53.95		52.316	22.63	
30.7	53.289	31.81		52.944	59.34		22.479	55.57		52.635	21.85	
May 10.7	53.574	30.56		53.304	59.09		22.785	57.64		52.943	21.07	
20.6	53.845	29.21		53.645	58.99		23.069	60.08		53.238	20.31	
30.6	54.094	27.81		53.962	59.05		23.323	62.82		53.512	19.61	
June 9.6	54.318	26.39		54.248	59.30		23.542	65.78		53.758	18.97	
19.6	54.512	24.99		54.494	59.70		23.720	68.88		53.972	18.43	
29.5	54.669	23.66		54.697	60.25		23.854	72.02		54.149	18.01	
July 9.5	54.786	22.43		54.850	60.95		23.940	75.12		54.283	17.71	
19.5	54.862	21.33		54.950	61.74		23.976	78.11		54.372	17.53	
29.4	54.894	20.35		54.994	62.61		23.961	80.94		54.414	17.46	
Aug. 8.4	54.882	19.52		54.985	63.52		23.897	83.52		54.410	17.48	
18.4	54.829	18.85		54.922	64.42		23.788	85.82		54.361	17.57	
28.4	54.740	18.33		54.812	65.26		23.636	87.79		54.272	17.72	
Sept. 7.3	54.617	17.95		54.660	65.99		23.450	89.39		54.147	17.90	
17.3	54.470	17.71		54.476	66.60		23.236	90.59		53.995	18.08	
27.3	54.306	17.60		54.270	67.02		23.003	91.37		53.823	18.25	
Oct. 7.3	54.136	17.62		54.054	67.23		22.761	91.71		53.644	18.39	
17.2	53.969	17.76		53.842	67.23		22.521	91.59		53.467	18.48	
27.2	53.814	18.03		53.643	66.99		22.292	91.01		53.304	18.51	
Nov. 6.2	53.680	18.41		53.472	66.55		22.085	90.00		53.163	18.51	
16.1	53.576	18.90		53.338	65.90		21.908	88.53		53.054	18.46	
26.1	53.508	19.51		53.248	65.08		21.768	86.68		52.983	18.39	
Dec. 6.1	53.480	20.23		53.209	64.13		21.672	84.47		52.955	18.30	
16.1	53.493	21.03		53.224	63.08		21.624	81.94		52.972	18.20	
26.0	53.548	21.91		53.293	61.97		21.626	79.20		53.034	18.10	
36.0	53.644	22.82		53.413	60.83		21.677	76.33		53.139	18.01	
Mean Place	50.651	28.20		49.557	66.34		20.420	69.57		49.713	23.62	
Sec δ , Tan δ	1.004	-0.088		1.270	-0.782		1.236	+0.726		1.072	-0.387	
$D_{\phi} \alpha$, $D_{\omega} \alpha$	+0.06	0.00		+0.08	+0.01		+0.04	-0.01		+0.07	+0.01	
$D_{\phi} \delta$, $D_{\omega} \delta$	+0.1	-1.0		+0.1	-1.0		+0.1	-1.0		+0.1	-1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Sagittarii. Mag. 4.9		δ Draconis. Mag. 3.2		δ Sagittarii. Mag. 5.0		θ Lyrae. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 10	° ' " -25 23	h m 19 12	° ' " +67 30	h m 19 12	° ' " -19 5	h m 19 13	° ' " +37 58
	s	"	s	"	s	"	s	"
Jan. 1.0	26.881	66.12	28.76	57.42	46.514	68.82	28.124	67.33
11.0	27.011	65.74	28.75	54.00	46.639	68.83	28.194	64.38
21.0	27.183	65.34	28.85	50.57	46.802	68.82	28.312	61.45
30.9	27.391	64.93	29.05	47.25	46.996	68.77	28.476	58.65
Feb. 9.9	27.629	64.50	29.35	44.19	47.221	68.66	28.681	56.10
19.9	27.893	64.02	29.74	41.49	47.471	68.48	28.924	53.90
Mar. 1.9	28.177	63.50	30.22	39.26	47.741	68.19	29.198	52.12
11.8	28.480	62.92	30.75	37.59	48.028	67.79	29.498	50.86
21.8	28.796	62.29	31.33	36.53	48.330	67.27	29.818	50.16
31.8	29.121	61.60	31.93	36.14	48.641	66.64	30.151	50.05
Apr. 10.7	29.453	60.88	32.54	36.40	48.957	65.91	30.491	50.53
20.7	29.786	60.15	33.15	37.32	49.276	65.10	30.831	51.57
30.7	30.115	59.42	33.73	38.84	49.592	64.23	31.163	53.13
May 10.7	30.436	58.73	34.27	40.92	49.899	63.33	31.481	55.17
20.6	30.741	58.09	34.74	43.47	50.193	62.45	31.775	57.61
30.6	31.027	57.54	35.15	46.42	50.469	61.60	32.041	60.36
June 9.6	31.286	57.08	35.48	49.67	50.717	60.82	32.272	63.35
19.6	31.511	56.75	35.72	53.14	50.934	60.14	32.461	66.48
29.5	31.699	56.56	35.87	56.72	51.116	59.56	32.605	69.68
July 9.5	31.843	56.48	35.90	60.34	51.256	59.11	32.698	72.87
19.5	31.941	56.53	35.84	63.88	51.358	58.79	32.741	75.95
29.4	31.991	56.69	35.69	67.29	51.401	58.59	32.733	78.88
Aug. 8.4	31.992	56.94	35.45	70.49	51.404	58.49	32.673	81.59
18.4	31.947	57.25	35.12	73.40	51.363	58.49	32.566	84.02
28.4	31.859	57.59	34.70	75.96	51.280	58.56	32.415	86.11
Sept. 7.3	31.734	57.94	34.22	78.12	51.161	58.70	32.228	87.84
17.3	31.579	58.26	33.68	79.84	51.015	58.85	32.010	89.17
27.3	31.405	58.52	33.11	81.07	50.848	59.00	31.772	90.08
Oct. 7.3	31.221	58.71	32.52	81.79	50.671	59.15	31.524	90.54
17.2	31.038	58.81	31.92	81.97	50.497	59.28	31.275	90.53
27.2	30.868	58.81	31.34	81.60	50.333	59.37	31.036	90.06
Nov. 6.2	30.719	58.72	30.78	80.68	50.192	59.44	30.818	89.13
16.1	30.603	58.55	30.28	79.22	50.080	59.48	30.627	87.74
26.1	30.525	58.30	29.83	77.24	50.004	59.51	30.474	85.92
Dec. 6.1	30.490	58.00	29.46	74.81	49.969	59.52	30.364	83.73
16.1	30.501	57.66	29.17	71.99	49.978	59.53	30.301	81.22
26.0	30.559	57.30	28.99	68.84	50.031	59.55	30.287	78.47
36.0	30.661	56.92	28.92	65.50	50.126	59.56	30.324	75.57
Mean Place	27.129	62.96	32.414	55.85	46.758	65.88	29.188	67.19
Sec δ , Tan δ	1.107	-0.475	2.615	+2.416	1.058	-0.346	1.269	+0.781
$D\psi a$, $D_{\omega} a$	+0.07	+0.01	0.00	-0.05	+0.07	+0.01	+0.04	-0.02
$D\psi \delta$, $D_{\omega} \delta$	+0.1	-1.0	+0.1	-1.0	+0.1	-1.0	+0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Aquilæ. Mag. 5.1		κ Cygni. Mag. 4.0		τ Draconis. Mag. 4.6		δ Aquilæ. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 13	° ' " +11 26	h m 19 15	° ' " +53 12	h m 19 17	° ' " +73 11	h m 19 21	° ' " + 2 56
Jan. 1.0	54.783	40.09	9.264	54.67	4.32	68.70	18.471	52.60
11.0	54.880	38.28	9.304	51.37	4.26	65.32	18.568	51.28
21.0	55.015	36.49	9.409	48.07	4.33	61.90	18.703	49.98
30.9	55.183	34.82	9.578	44.89	4.55	58.57	18.870	48.78
Feb. 9.9	55.382	33.32	9.807	41.97	4.91	55.48	19.065	47.72
19.9	55.606	32.08	10.088	39.41	5.38	52.73	19.286	46.86
Mar. 1.9	55.852	31.14	10.416	37.32	5.96	50.43	19.529	46.28
11.8	56.117	30.58	10.782	35.77	6.63	48.68	19.791	45.99
21.8	56.396	30.41	11.177	34.84	7.36	47.54	20.067	46.01
31.8	56.685	30.65	11.589	34.54	8.14	47.05	20.354	46.37
Apr. 10.8	56.980	31.29	12.009	34.88	8.92	47.21	20.648	47.06
20.7	57.278	32.31	12.427	35.87	9.70	48.02	20.946	48.05
30.7	57.572	33.67	12.832	37.43	10.45	49.45	21.242	49.31
May 10.7	57.857	35.33	13.215	39.52	11.14	51.43	21.531	50.79
20.6	58.127	37.21	13.565	42.08	11.75	53.90	21.808	52.45
30.6	58.376	39.28	13.874	45.01	12.27	56.77	22.065	54.22
June 9.6	58.599	41.45	14.133	48.21	12.67	59.97	22.298	56.06
19.6	58.792	43.67	14.338	51.61	12.95	63.38	22.501	57.91
29.5	58.948	45.88	14.481	55.13	13.12	66.95	22.670	59.73
July 9.5	59.064	48.01	14.561	58.64	13.15	70.55	22.799	61.46
19.5	59.138	50.03	14.575	62.08	13.04	74.10	22.887	63.06
29.5	59.168	51.90	14.523	65.38	12.82	77.53	22.931	64.52
Aug. 8.4	59.154	53.57	14.408	68.46	12.48	80.77	22.932	65.81
18.4	59.098	55.04	14.233	71.25	12.02	83.74	22.891	66.90
28.4	59.005	56.26	14.005	73.68	11.45	86.37	22.811	67.80
Sept. 7.3	58.879	57.23	13.731	75.73	10.79	88.62	22.697	68.49
17.3	58.727	57.93	13.420	77.34	10.08	90.43	22.556	68.99
27.3	58.556	58.37	13.083	78.47	9.31	91.77	22.396	69.27
Oct. 7.3	58.377	58.53	12.730	79.10	8.50	92.61	22.227	69.36
17.2	58.199	58.41	12.377	79.22	7.68	92.91	22.058	69.25
27.2	58.032	58.03	12.033	78.81	6.88	92.66	21.898	68.94
Nov. 6.2	57.883	57.37	11.710	77.85	6.11	91.86	21.755	68.44
16.2	57.761	56.45	11.422	76.39	5.40	90.51	21.639	67.75
26.1	57.671	55.28	11.177	74.45	4.77	88.65	21.555	66.89
Dec. 6.1	57.620	53.89	10.984	72.07	4.23	86.31	21.507	65.88
16.1	57.609	52.31	10.851	69.31	3.80	83.56	21.499	64.72
26.0	57.639	50.60	10.781	66.26	3.50	80.48	21.531	63.46
36.0	57.710	48.80	10.778	63.02	3.35	77.18	21.603	62.14
Mean Place	55.236	41.49	11.130	53.51	9.537	66.36	18.819	54.21
Sec δ , Tan δ	1.020	+0.202	1.670	+1.337	3.460	+3.312	1.001	+0.052
$D\psi\alpha$, $D\omega\alpha$	+0.06	0.00	+0.03	-0.03	-0.02	-0.07	+0.06	0.00
$D\psi\delta$, $D\omega\delta$	+0.1	-0.9	+0.1	-0.9	+0.1	-0.9	+0.1	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cygni. Mag. 3.2			γ Cygni. Mag. 3.9			μ Aquilæ. Mag. 4.6			δ Sagittarii. Mag. 4.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	19 27		+27 46	19 27		+51 32	19 30		+ 7 11	19 31		-25 3
Jan. 1.0	21.686		64.94	35.110		71.22	1.730		66.15	39.235		67.46
11.0	21.754	68	62.40	35.135	25	67.99	1.817	87	64.61	39.344	109	67.05
21.0	21.864	110	59.87	35.224	89	64.74	1.940	123	63.09	39.493	149	66.60
31.0	22.013	149	57.45	35.373	242	61.59	2.095	155	61.66	39.677	184	66.11
Feb. 9.9	22.197	184	55.24	35.580	207	58.66	2.280	185	60.41	39.893	216	65.57
19.9	22.415	218	53.32	35.839	259	56.06	2.493	213	59.36	40.137	244	64.98
Mar. 1.9	22.662	247	51.79	36.145	306	53.91	2.729	236	58.60	40.405	268	64.33
11.8	22.932	270	50.71	36.490	345	52.29	2.985	256	58.15	40.693	288	63.60
21.8	23.221	289	50.12	36.864	374	51.25	3.257	272	58.07	40.998	305	62.81
31.8	23.526	305	50.06	37.261	397	50.85	3.541	284	58.36	41.316	318	61.97
Apr. 10.8	23.839	313	50.54	37.668	407	51.08	3.834	293	59.01	41.643	327	61.08
20.7	24.155	316	51.52	38.077	409	51.93	4.132	298	59.99	41.976	333	60.17
30.7	24.468	313	52.97	38.477	400	53.39	4.429	297	61.29	42.309	333	59.27
May 10.7	24.771	308	54.82	38.859	382	55.38	4.720	291	62.86	42.637	328	58.40
20.7	25.059	288	57.05	39.212	353	57.83	4.999	279	64.63	42.954	317	57.60
30.6	25.323	264	59.56	39.528	316	60.67	5.259	260	66.55	43.252	298	56.90
June 9.6	25.560	237	62.27	39.799	271	63.82	5.497	238	68.57	43.526	274	56.30
19.6	25.761	201	65.11	40.019	220	67.18	5.705	208	70.64	43.769	243	55.83
29.5	25.922	161	68.01	40.181	162	70.66	5.878	173	72.67	43.975	206	55.51
July 9.5	26.040	118	70.88	40.282	101	74.17	6.012	134	74.63	44.139	164	55.36
19.5	26.112	72	73.67	40.319	37	77.63	6.105	98	76.49	44.258	119	55.34
29.5	26.136	24	76.30	40.293	26	80.97	6.154	49	78.18	44.328	70	55.45
Aug. 8.4	26.113	23	78.74	40.203	90	84.10	6.159	5	79.71	44.349	21	55.69
18.4	26.045	68	80.92	40.055	148	86.96	6.122	37	81.04	44.322	27	56.00
28.4	25.935	110	82.82	39.854	201	89.49	6.045	77	82.13	44.250	72	56.37
Sept. 7.4	25.790	145	84.39	39.606	248	91.65	5.934	111	83.01	44.139	111	56.77
17.3	25.615	175	85.81	39.321	285	93.38	5.796	138	83.64	43.996	143	57.16
27.3	25.420	195	86.45	39.006	315	94.65	5.636	160	84.04	43.829	167	57.52
Oct. 7.3	25.213	207	86.92	38.676	330	95.43	5.466	170	84.20	43.650	179	57.81
17.2	25.003	210	86.98	38.340	336	95.69	5.294	172	84.13	43.467	183	58.01
27.2	24.801	202	86.63	38.011	320	95.44	5.130	164	83.81	43.293	174	58.12
Nov. 6.2	24.616	185	85.88	37.702	309	94.66	4.982	148	83.29	43.139	154	58.13
16.2	24.456	160	84.74	37.422	280	93.36	4.858	124	82.51	43.012	127	58.04
26.1	24.328	128	83.23	37.180	242	91.56	4.764	94	81.54	42.918	94	57.87
Dec. 6.1	24.237	91	81.39	36.987	193	89.32	4.707	57	80.37	42.866	52	57.61
16.1	24.188	49	79.26	36.850	137	86.69	4.688	19	79.05	42.857	9	57.31
26.1	24.183	5	76.91	36.771	79	83.74	4.708	20	77.61	42.893	36	56.96
36.0	24.221	38	74.42	36.755	16	80.60	4.768	60	76.08	42.973	80	56.57
Mean Place	22.426		64.40	36.836		68.92	2.113		67.10	39.459		64.19
Sec δ , Tan δ	1.130		+0.527	1.608		+1.260	1.008		+0.127	1.104		-0.468
$D\delta\alpha$, $D\alpha\alpha$	+0.05		-0.01	+0.03		-0.03	+0.06		0.00	+0.07		+0.01
$D\delta\delta$, $D\delta\delta$	+0.1		-0.9	+0.1		-0.9	+0.2		-0.9	+0.2		-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Aquilæ. Mag. 5.0		θ Cygni. Mag. 4.6		δ Sagittarii. Mag. 5.4		β Sagittæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 32	° ' " 7 12	h m 19 34	° ' " +50 1	h m 19 35	° ' " -16 28	h m 19 37	° ' " +17 16
	s	"	s	"	s	"	s	"
Jan. 1.0	25.381	48.17	11.352	44.90	57.948	66.99	18.730	58.95
11.0	25.475	48.86	11.371	41.73	58.045	67.11	18.800	56.92
21.0	25.606	49.51	11.451	38.53	58.181	67.18	18.907	54.89
31.0	25.770	50.11	11.591	35.41	58.351	67.20	19.050	52.96
Feb. 9.9	25.962	50.58	11.786	32.49	58.551	67.13	19.226	51.20
19.9	26.182	50.89	12.032	29.90	58.777	66.96	19.431	49.71
Mar. 1.9	26.422	51.02	12.324	27.74	59.027	66.66	19.662	48.54
11.8	26.683	50.95	12.654	26.09	59.295	66.22	19.916	47.75
21.8	26.959	50.63	13.015	25.02	59.581	65.64	20.188	47.39
31.8	27.248	50.08	13.398	24.58	59.881	64.91	20.475	47.48
Apr. 10.8	27.545	49.31	13.795	24.76	60.190	64.05	20.772	48.01
20.7	27.848	48.33	14.194	25.56	60.504	63.08	21.074	48.97
30.7	28.151	47.17	14.587	26.97	60.820	62.03	21.376	50.33
May 10.7	28.449	45.89	14.965	28.90	61.131	60.93	21.672	52.04
20.7	28.737	44.51	15.316	31.31	61.431	59.82	21.957	54.05
30.6	29.008	43.08	15.633	34.10	61.716	58.74	22.222	56.27
June 9.6	29.256	41.66	15.908	37.21	61.977	57.71	22.463	58.66
19.6	29.475	40.26	16.134	40.54	62.211	56.78	22.673	61.14
29.5	29.661	38.95	16.305	43.99	62.409	55.96	22.847	63.64
July 9.5	29.810	37.75	16.417	47.49	62.568	55.29	22.981	66.11
19.5	29.914	36.68	16.467	50.95	62.683	54.75	23.073	68.49
29.5	29.975	35.75	16.455	54.29	62.753	54.35	23.120	70.71
Aug. 8.4	29.992	34.99	16.382	57.43	62.777	54.10	23.121	72.74
18.4	29.964	34.38	16.252	60.33	62.755	53.97	23.079	74.56
28.4	29.897	33.92	16.068	62.89	62.690	53.94	22.996	76.11
Sept. 7.4	29.793	33.60	15.837	65.09	62.589	54.01	22.878	77.39
17.3	29.662	33.43	15.568	66.87	62.456	54.14	22.731	78.38
27.3	29.509	33.36	15.271	68.20	62.302	54.30	22.562	79.05
Oct. 7.3	29.343	33.40	14.957	69.05	62.133	54.49	22.381	79.40
17.2	29.177	33.56	14.636	69.40	61.962	54.69	22.197	79.45
27.2	29.018	33.81	14.321	69.22	61.799	54.88	22.019	79.16
Nov. 6.2	28.875	34.14	14.023	68.52	61.651	55.07	21.856	78.56
16.2	28.757	34.55	13.752	67.31	61.529	55.24	21.715	77.65
26.1	28.670	35.04	13.518	65.60	61.439	55.40	21.605	76.43
Dec. 6.1	28.619	35.60	13.330	63.44	61.387	55.56	21.529	74.96
16.1	28.608	36.22	13.194	60.89	61.375	55.71	21.491	73.25
26.1	28.637	36.89	13.114	58.03	61.405	55.85	21.492	71.37
36.0	28.706	37.62	13.094	54.93	61.476	55.98	21.535	69.37
Mean Place	25.638	46.14	12.963	42.06	58.167	64.31	19.243	58.67
Sec δ , Tan δ	1.008	-0.127	1.557	+1.193	1.043	-0.296	1.048	+0.311
$D\psi\alpha$, $D_\omega\alpha$	+0.06	0.00	+0.03	-0.03	+0.07	+0.01	+0.05	-0.01
$D\psi\delta$, $D_\omega\delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Cygni. Mag. 5.0		f Sagittarii. Mag. 5.1		γ Aquilæ. Mag. 2.8		δ Cygni. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 41	° ' " +87 8	h m 19 41	° ' " -19 57	h m 19 42	° ' " +10 24	h m 19 42	° ' " +44 55
	s "	"	s "	"	s "	"	s "	"
Jan. 1.0	16.044	74.39	31.089	44.50	18.413	36.36	21.588	42.44
11.0	16.083	71.59	31.183	44.38	18.484	34.68	21.610	39.40
21.0	16.170	68.75	31.316	44.22	18.592	33.03	21.686	36.33
31.0	16.301	65.98	31.483	43.99	18.733	31.46	21.814	33.33
Feb. 9.9	16.475	63.42	31.682	43.70	18.906	30.04	21.992	30.51
19.9	16.688	61.15	31.907	43.32	19.108	28.86	22.216	28.01
Mar. 1.9	16.937	59.28	32.158	42.84	19.333	27.97	22.482	25.91
11.9	17.215	57.87	32.428	42.24	19.582	27.42	22.783	24.30
21.8	17.519	57.00	32.716	41.52	19.848	27.24	23.113	23.25
31.8	17.841	56.69	33.020	40.70	20.129	27.46	23.466	22.81
Apr. 10.8	18.175	56.95	33.333	39.79	20.421	28.07	23.832	22.97
20.7	18.515	57.78	33.653	38.79	20.719	29.05	24.204	23.73
30.7	18.855	59.14	33.975	37.75	21.019	30.37	24.573	25.07
May 10.7	19.184	61.00	34.294	36.70	21.314	31.99	24.929	26.93
20.7	19.495	63.27	34.602	35.67	21.599	33.84	25.267	29.25
30.6	19.785	65.90	34.896	34.69	21.866	35.88	25.575	31.96
June 9.6	20.042	68.79	35.167	33.80	22.111	38.04	25.846	34.98
19.6	20.260	71.89	35.408	33.02	22.327	40.26	26.074	38.20
29.6	20.436	75.07	35.615	32.38	22.510	42.47	26.254	41.56
July 9.5	20.565	78.27	35.782	31.87	22.653	44.63	26.381	44.96
19.5	20.644	81.42	35.905	31.52	22.754	46.68	26.451	48.33
29.5	20.670	84.44	35.982	31.33	22.811	48.58	26.464	51.59
Aug. 8.4	20.644	87.29	36.011	31.26	22.824	50.30	26.420	54.65
18.4	20.569	89.88	35.994	31.30	22.793	51.82	26.321	57.48
28.4	20.448	92.18	35.933	31.45	22.722	53.11	26.173	59.99
Sept. 7.4	20.287	94.12	35.834	31.68	22.616	54.15	25.981	62.15
17.3	20.095	95.69	35.701	31.94	22.481	54.94	25.752	63.92
27.3	19.874	96.85	35.544	32.22	22.323	55.47	25.495	65.25
Oct. 7.3	19.639	97.59	35.374	32.48	22.153	55.73	25.221	66.11
17.3	19.399	97.87	35.200	32.71	21.979	55.73	24.940	66.50
27.2	19.164	97.69	35.032	32.90	21.811	55.48	24.663	66.38
Nov. 6.2	18.943	97.04	34.880	33.05	21.657	54.95	24.401	65.76
16.2	18.745	95.93	34.753	33.14	21.525	54.17	24.163	64.64
26.1	18.579	94.40	34.657	33.19	21.422	53.16	23.958	63.05
Dec. 6.1	18.450	92.47	34.599	33.20	21.353	51.93	23.794	61.02
16.1	18.365	90.20	34.582	33.17	21.320	50.52	23.677	58.61
26.1	18.325	87.65	34.607	33.11	21.326	48.96	23.610	55.89
36.0	18.332	84.90	34.674	33.01	21.370	47.32	23.596	52.95
Mean Place	17.033	72.00	31.295	41.56	18.817	36.48	22.897	39.24
Sec δ, Tan δ	1.255	+0.758	1.064	-0.363	1.017	+0.184	1.412	+0.997
D _ψ α, D _ω α	+0.04	-0.02	+0.07	+0.01	+0.06	-0.01	+0.04	-0.03
D _ψ δ, D _ω δ	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Sagittæ. Mag. 3.8		α Aquilæ. (Altair.) Mag. 0.9		γ Aquilæ. Var. 3.7-4.4		ϵ Draconis. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 43	° ' " +18 19	h m 19 46	° ' " + 8 38	h m 19 48	° ' " + 0 47	h m 19 48	° ' " +70 3
	s	"	s	"	s	"	s	"
Jan. 1.0	40.696	44.37	43.646	53.37	14.429	29.47	23.64	29.12
11.0	40.758	42.31	43.719	51.82	14.503	28.36	23.52	25.86
21.0	40.858	40.25	43.827	50.29	14.613	27.26	23.52	22.49
31.0	40.993	38.28	43.968	48.84	14.754	26.24	23.64	19.13
Feb. 9.9	41.163	36.47	44.141	47.55	14.927	25.36	23.87	15.91
19.9	41.363	34.93	44.342	46.49	15.127	24.68	24.21	12.98
Mar. 1.9	41.588	33.71	44.568	45.70	15.350	24.22	24.66	10.44
11.9	41.839	32.87	44.815	45.24	15.595	24.04	25.19	8.38
21.8	42.109	32.47	45.082	45.15	15.859	24.16	25.79	6.89
31.8	42.395	32.52	45.362	45.43	16.137	24.58	26.43	6.04
Apr. 10.8	42.692	33.02	45.654	46.09	16.427	25.30	27.11	5.82
20.7	42.996	33.96	45.953	47.09	16.725	26.30	27.79	6.27
30.7	43.300	35.31	46.253	48.43	17.025	27.58	28.46	7.34
May 10.7	43.600	37.02	46.550	50.05	17.322	29.04	29.10	9.01
20.7	43.888	39.04	46.836	51.89	17.611	30.69	29.69	11.20
30.6	44.158	41.28	47.107	53.90	17.885	32.44	30.21	13.86
June 9.6	44.404	43.70	47.354	56.03	18.137	34.24	30.65	16.89
19.6	44.619	46.23	47.572	58.19	18.362	36.06	30.99	20.21
29.6	44.799	48.78	47.758	60.35	18.555	37.83	31.24	23.74
July 9.5	44.939	51.30	47.905	62.43	18.710	39.50	31.37	27.38
19.5	45.036	53.74	48.010	64.41	18.823	41.07	31.40	31.03
29.5	45.087	56.04	48.071	66.24	18.893	42.49	31.31	34.63
Aug. 8.4	45.093	58.14	48.087	67.89	18.919	43.72	31.12	38.08
18.4	45.055	60.03	48.061	69.33	18.902	44.78	30.82	41.33
28.4	44.976	61.66	47.994	70.54	18.843	45.64	30.43	44.29
Sept. 7.4	44.861	63.02	47.892	71.53	18.748	46.30	29.96	46.90
17.3	44.716	64.06	47.760	72.26	18.623	46.77	29.41	49.12
27.3	44.548	64.80	47.607	72.75	18.477	47.05	28.81	50.89
Oct. 7.3	44.368	65.23	47.439	73.98	18.316	47.15	28.17	52.17
17.3	44.183	65.31	47.269	72.97	18.150	47.07	27.51	52.93
27.2	44.003	65.07	47.105	72.71	17.989	46.81	26.85	53.14
Nov. 6.2	43.837	64.50	46.953	72.22	17.840	46.39	26.20	52.79
16.2	43.693	63.61	46.824	71.48	17.714	45.81	25.58	51.86
26.1	43.578	62.41	46.723	70.54	17.616	45.08	25.03	50.39
Dec. 6.1	43.496	60.94	46.656	69.38	17.552	44.22	24.54	48.41
16.1	43.451	59.22	46.625	68.06	17.524	43.25	24.14	45.96
26.1	43.446	57.32	46.633	66.62	17.534	42.18	23.83	43.13
36.0	43.481	55.30	46.678	65.09	17.582	41.07	23.64	39.99
Mean Place	41.215	43.62	44.024	53.59	14.719	30.35	27.750	23.40
Sec δ , Tan δ	1.053	+0.331	1.012	+0.152	1.000	+0.014	2.932	+2.756
$D\phi\alpha$, $D_\omega\alpha$	+0.06	-0.01	+0.06	0.00	+0.06	0.00	0.00	-0.08
$D\phi\delta$, $D_\omega\delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Sagittarii. Mag. 4.2		♉ Pavonis. Mag. 4.1		♊ Aquilæ. Mag. 3.9		♋ Sagittæ. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 49 s	° ' " -42 5 "	h m 19 50 s	° ' " -73 7 "	h m 19 51 s	° ' " + 6 11 "	h m 19 55 s	° ' " +19 15 "
Jan. 1.1	31.909	19.32	58.82	57.44	13.837	54.90	3.417	58.96
11.0	32.008 ⁹⁰	17.83 ¹⁴⁹	58.94 ¹²	54.37 ³⁰⁷	13.903 ⁶⁶	53.47 ¹⁴³	3.467 ⁵⁰	56.90 ²⁰⁶
21.0	32.156 ¹⁴⁸	16.27 ¹⁵⁶	59.20 ²⁶	51.26 ³¹¹	14.005 ¹⁰²	52.06 ¹⁴¹	3.554 ⁸⁷	54.83 ²⁰⁷
31.0	32.350 ¹⁹⁴	14.68 ¹⁵⁹	59.57 ³⁷	48.19 ³⁰⁷	14.140 ¹³⁵	50.72 ¹³⁴	3.679 ¹²⁵	52.83 ²⁰⁰
Feb. 9.9	32.583 ²³³	13.09 ¹⁵⁹	60.07 ⁵⁰	45.22 ²⁹⁷	14.307 ¹⁶⁷	49.54 ¹¹⁸	3.837 ¹⁵⁸	50.98 ¹⁸⁵
19.9	32.854 ²⁷¹	11.52 ¹⁵⁷	60.66 ⁵⁹	42.42 ²⁸⁰	14.501 ¹⁹⁴	48.56 ⁹⁸	4.026 ¹⁸⁹	49.39 ¹⁵⁹
Mar. 1.9	33.158 ³⁰⁴	10.00 ¹⁵²	61.36 ⁷⁰	39.87 ²⁵⁵	14.721 ²²⁰	47.85 ⁷¹	4.244 ²¹⁸	48.12 ¹²⁷
11.9	33.488 ³³⁰	8.54 ¹⁴⁶	62.13 ⁷⁷	37.59 ²²⁸	14.962 ²⁴¹	47.44 ⁴¹	4.487 ²⁴³	47.23 ⁸⁹
21.8	33.841 ³⁵³	7.16 ¹³⁸	62.96 ⁸³	35.64 ¹⁹⁵	15.224 ²⁶²	47.38 ⁶	4.752 ²⁶⁵	46.76 ⁴⁷
31.8	34.213 ³⁷²	5.89 ¹²⁷	63.83 ⁸⁷	34.05 ¹⁵⁹	15.501 ²⁷⁷	47.67 ²⁹	5.034 ²⁸²	46.75 ¹
Apr. 10.8	34.599 ³⁸⁶	4.75 ¹¹⁴	64.73 ⁹⁰	32.84 ¹²¹	15.791 ²⁹⁰	48.31 ⁶⁴	5.330 ²⁹⁶	47.20 ⁴⁵
20.7	34.994 ³⁹⁵	3.75 ¹⁰⁰	65.66 ⁹³	32.04 ⁸⁰	16.088 ²⁹⁷	49.28 ⁹⁷	5.636 ³⁰⁶	48.10 ⁹⁰
30.7	35.392 ³⁹⁸	2.92 ⁸³	66.58 ⁹²	31.66 ³⁸	16.388 ³⁰⁰	50.57 ¹²⁹	5.943 ³⁰⁷	49.41 ¹³¹
May 10.7	35.786 ³⁹⁴	2.30 ⁶²	67.48 ⁸⁷	31.70 ⁴	16.686 ²⁹⁸	52.12 ¹⁵⁵	6.247 ³⁰⁴	51.10 ¹⁶⁹
20.7	36.170 ³⁸⁴	1.88 ⁴²	68.35 ⁸⁰	32.17 ⁴⁷	16.974 ²⁸⁸	53.87 ¹⁷⁵	6.541 ²⁹⁴	53.11 ²⁰¹
30.6	36.535 ³⁶⁵	1.70 ¹⁸	69.16 ⁸¹	33.04 ⁸⁷	17.248 ²⁷⁴	55.77 ¹⁹⁰	6.819 ²⁷⁸	55.36 ²²⁵
June 9.6	36.871 ³³⁶	1.75 ⁵	69.88 ⁷²	34.32 ¹²⁸	17.500 ²⁵²	57.78 ²⁰¹	7.073 ²⁵⁴	57.80 ²⁴⁴
19.6	37.173 ³⁰²	2.05 ³⁰	70.53 ⁶⁵	35.95 ¹⁶³	17.724 ²²⁴	59.82 ²⁰⁴	7.297 ²²⁴	60.36 ²⁵⁶
29.6	37.433 ²⁶⁰	2.56 ⁵¹	71.07 ⁵⁴	37.88 ¹⁹³	17.917 ¹⁹³	61.84 ²⁰²	7.488 ¹⁹¹	62.96 ²⁶⁰
July 9.5	37.644 ²¹¹	3.30 ⁷⁴	71.49 ⁴²	40.08 ²²⁰	18.071 ¹⁵⁴	63.80 ¹⁹⁶	7.639 ¹⁵¹	65.54 ²⁵⁸
19.5	37.801 ¹⁵⁷	4.20 ⁹⁰	71.77 ²⁸	42.46 ²³⁸	18.183 ¹¹²	65.65 ¹⁸⁵	7.746 ¹⁰⁷	68.05 ²⁵¹
29.5	37.901 ¹⁰⁰	5.25 ¹⁰⁶	71.92 ¹⁵	44.95 ²⁴⁹	18.252 ⁶⁹	67.34 ¹⁶⁹	7.808 ⁶²	70.42 ²³⁷
Aug. 8.4	37.940 ³⁹	6.41 ¹¹⁶	71.93 ¹	47.46 ²⁶¹	18.278 ²⁴	68.87 ¹⁵³	7.824 ¹⁶	72.61 ²¹⁹
18.4	37.920 ²⁰	7.61 ¹²⁰	71.78 ¹⁵	49.92 ²⁴⁶	18.257 ¹⁹	70.20 ¹³³	7.796 ²⁸	74.59 ¹⁹⁸
28.4	37.846 ⁷⁴	8.79 ¹¹⁸	71.52 ²⁶	52.23 ²³¹	18.197 ⁶⁰	71.30 ¹¹⁰	7.725 ⁷¹	76.31 ¹⁷²
Sept. 7.4	37.721 ¹²⁶	9.92 ¹¹³	71.13 ³⁹	54.29 ²⁰⁶	18.102 ⁹⁵	72.19 ⁸⁹	7.617 ¹⁰⁸	77.76 ¹⁴⁵
17.3	37.554 ¹⁶⁷	10.94 ¹⁰²	70.63 ⁵⁰	56.02 ¹⁷³	17.975 ¹²⁷	72.84 ⁶⁵	7.478 ¹³⁹	78.90 ¹¹⁴
27.3	37.355 ¹⁹⁹	11.79 ⁸⁵	70.05 ⁵⁸	57.35 ¹³³	17.826 ¹⁴⁹	73.28 ⁴⁴	7.315 ¹⁶³	79.73 ⁸³
Oct. 7.3	37.134 ²²¹	12.40 ⁶¹	69.41 ⁶⁴	58.22 ⁸⁷	17.662 ¹⁶⁴	73.47 ¹⁹	7.137 ¹⁷⁸	80.24 ⁵¹
17.3	36.906 ²²⁸	12.77 ³⁷	68.74 ⁶⁷	58.57 ³⁵	17.494 ¹⁶⁸	73.45 ²	6.953 ¹⁸⁴	80.40 ¹⁶
27.2	36.683 ²²³	12.86 ⁹	68.08 ⁶⁶	58.38 ¹⁹	17.330 ¹⁶⁴	73.19 ²⁶	6.772 ¹⁸¹	80.23 ¹⁷
Nov. 6.2	36.477 ²⁰⁶	12.67 ¹⁹	67.46 ⁶²	57.66 ⁷²	17.179 ¹⁵¹	72.72 ⁴⁷	6.604 ¹⁶⁸	79.73 ⁵⁰
16.2	36.300 ¹⁷⁷	12.21 ⁴⁶	66.89 ⁵⁷	56.41 ¹²⁵	17.048 ¹³¹	72.04 ⁶⁸	6.454 ¹⁵⁰	78.90 ⁸³
26.1	36.160 ¹⁴⁰	11.48 ⁷³	66.41 ⁴⁸	54.67 ¹⁷⁴	16.945 ¹⁰³	71.16 ⁸⁸	6.332 ¹²²	77.75 ¹¹⁵
Dec. 6.1	36.068 ⁹²	10.52 ⁹⁶	66.03 ³⁸	52.50 ²¹⁷	16.875 ⁷⁰	70.10 ¹⁰⁶	6.242 ⁹⁰	76.32 ¹⁴³
16.1	36.026 ⁴²	9.35 ¹¹⁷	65.78 ²⁵	49.97 ²⁵³	16.841 ³⁴	68.87 ¹²³	6.188 ⁵⁴	74.64 ¹⁶⁸
26.1	36.035 ⁹	8.04 ¹³¹	65.67 ¹¹	47.18 ²⁷⁹	16.843 ²	67.54 ¹³³	6.172 ¹⁶	72.76 ¹⁸⁸
36.0	36.098 ⁶³	6.61 ¹⁴³	65.69 ²	44.20 ²⁹⁸	16.883 ⁴⁰	66.13 ¹⁴¹	6.195 ²³	70.74 ²⁰²
Mean Place	32.212	14.69	60.707	51.67	14.175	55.08	3.931	57.45
Sec δ, Tan δ	1.348	-0.903	3.446	-3.298	1.006	+0.109	1.059	+0.350
D _α α, D _α α	+0.08	+0.03	+0.14	+0.10	+0.06	0.00	+0.05	-0.01
D _δ δ, D _δ δ	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Sagittarii. Mag. 4.6		τ Aquilæ. Mag. 5.6		θ Aquilæ. Mag. 3.4		\circ Cygni seq. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 57	° ' -27 56	h m 20 0	° ' + 7 2	h m 20 7	° ' - 1 3	h m 20 10	° ' +46 29
	s	"	s	"	s	"	s	"
Jan. 1.1	33.222	33.32	4.806	35.65	1.133	67.00	59.832	26.67
11.0	33.305 ⁸³	32.68 ⁶⁴	4.864 ⁵⁸	34.22 ¹⁴³	1.190 ⁵⁷	67.96 ⁹⁶	59.813 ¹⁹	23.76 ²⁹¹
21.0	33.428 ¹²³	31.95 ⁷³	4.956 ⁹²	32.80 ¹⁴²	1.282 ⁹²	68.90 ⁹⁴	59.848 ³⁵	20.73 ³⁰³
31.0	33.588 ¹⁶⁰	31.18 ⁷⁷	5.083 ¹²⁷	31.45 ¹³⁵	1.407 ¹²⁵	69.76 ⁸⁶	59.937 ⁸⁹	17.70 ³⁰³
Feb. 10.0	33.780 ¹⁹²	30.35 ⁸³	5.241 ¹⁵⁸	30.26 ¹¹⁹	1.563 ¹⁵⁶	70.48 ⁷²	60.080 ¹⁴³	14.81 ²⁸⁹
	225	90	186	100	183	55	192	264
19.9	34.005	29.45	5.427	29.26	1.746	71.03	60.272	12.17
Mar. 1.9	34.257 ²⁵²	28.50 ⁹⁵	5.640 ²¹³	28.54 ⁷²	1.956 ²¹⁰	71.36 ³³	60.510 ²³⁸	9.89 ²²⁸
11.9	34.532 ²⁷⁵	27.49 ¹⁰¹	5.875 ²³⁵	28.11 ⁴³	2.189 ²³³	71.44 ⁸	60.790 ²⁸⁰	8.05 ¹⁸⁴
21.8	34.829 ²⁹⁷	26.43 ¹⁰⁶	6.132 ²⁵⁷	28.03 ⁸	2.443 ²⁵⁴	71.23 ²¹	61.107 ³¹⁷	6.74 ¹³¹
31.8	35.143 ³¹⁴	25.34 ¹⁰⁹	6.406 ²⁷⁴	28.31 ²⁸	2.715 ²⁷²	70.74 ⁴⁹	61.453 ³⁴⁶	6.00 ⁷⁴
	327	111	287	64	286	78	366	13
Apr. 10.8	35.470	24.23	6.693	28.95	3.001	69.96	61.819	5.87
20.8	35.807 ³³⁷	23.12 ¹¹¹	6.989 ²⁹⁶	29.92 ⁹⁷	3.298 ²⁹⁷	68.82 ¹⁰⁴	62.198 ³⁷⁹	6.36 ⁴⁹
30.7	36.149 ³⁴²	22.05 ¹⁰⁷	7.290 ³⁰¹	31.22 ¹³⁰	3.600 ³⁰²	67.63 ¹²⁹	62.582 ³⁸⁴	7.42 ¹⁰⁶
May 10.7	36.490 ³⁴¹	21.05 ¹⁰⁰	7.589 ²⁹⁹	32.79 ¹⁵⁷	3.903 ³⁰⁸	66.15 ¹⁴⁸	62.960 ³⁷⁸	9.04 ¹⁶²
20.7	36.823 ³³⁹	20.14 ⁹¹	7.880 ²⁹¹	34.57 ¹⁷⁸	4.200 ²⁹⁷	64.51 ¹⁶⁴	63.324 ³⁶⁴	11.15 ²¹¹
	313	78	278	195	285	174	338	254
30.7	37.142	19.36	8.158	36.52	4.485	62.77	63.662	13.69
June 9.6	37.439 ²⁹⁷	18.71 ⁶⁵	8.415 ²⁵⁷	38.57 ²⁰⁵	4.750 ²⁶⁵	60.99 ¹⁷⁸	63.967 ³⁰⁵	16.57 ²⁸⁸
19.6	37.707 ²⁸⁸	18.24 ⁴⁷	8.647 ²³²	40.67 ²¹⁰	4.991 ²⁴¹	59.21 ¹⁷⁸	64.232 ²⁶⁵	19.73 ³¹⁶
29.6	37.942 ²³⁵	17.96 ²⁸	8.845 ¹⁹⁸	42.77 ²¹⁰	5.200 ²⁰⁹	57.48 ¹⁷³	64.450 ²¹⁸	23.07 ³³⁴
July 9.5	38.135 ¹⁹⁸	17.86 ¹⁰	9.006 ¹⁶¹	44.80 ²⁰³	5.372 ¹⁷²	55.86 ¹⁶²	64.615 ¹⁶⁵	26.50 ⁸⁴³
	147	7	121	198	132	152	108	345
19.5	38.282	17.93	9.127	46.73	5.504	54.34	64.723	29.95
29.5	38.380 ⁹⁸	18.17 ²⁴	9.204 ⁷⁷	48.52 ¹⁷⁹	5.593 ⁸⁹	52.98 ¹³⁶	64.773 ⁵⁰	33.34 ³³⁹
Aug. 8.5	38.427 ⁴⁷	18.54 ³⁷	9.236 ³²	50.12 ¹⁶⁰	5.637 ⁴⁴	51.81 ¹¹⁷	64.764 ⁹	36.59 ³²⁵
18.4	38.423 ⁴	19.02 ⁴⁸	9.224 ¹²	51.54 ¹⁴²	5.637 ⁰	50.81 ¹⁰⁰	64.698 ⁶⁶	39.63 ³⁰⁴
28.4	38.372 ⁵¹	19.58 ⁵⁶	9.171 ⁵³	52.73 ¹¹⁹	5.594 ⁴³	50.00 ⁸¹	64.578 ¹²⁰	42.41 ²⁷⁸
	93	59	89	98	80	61	169	245
Sept. 7.4	38.279	20.17	9.082	53.69	5.514	49.39	64.409	44.86
17.4	38.148 ¹³¹	20.76 ⁵⁹	8.960 ¹²²	54.41 ⁷²	5.401 ¹¹³	48.96 ⁴³	64.199 ²¹⁰	46.94 ²⁰⁸
27.3	37.989 ¹⁵⁹	21.31 ⁵⁵	8.815 ¹⁴⁵	54.91 ⁵⁰	5.264 ¹³⁷	48.72 ²⁴	63.957 ²⁴²	48.61 ¹⁶⁷
Oct. 7.3	37.813 ¹⁷⁶	21.78 ⁴⁷	8.654 ¹⁶¹	55.16 ²⁵	5.110 ¹⁵⁴	48.64 ⁸	63.690 ²⁶⁷	49.83 ¹²²
17.3	37.628 ¹⁸⁵	22.14 ³⁶	8.487 ¹⁶⁷	55.18 ²	4.949 ¹⁶¹	48.72 ⁸	63.410 ²⁸⁰	50.57 ⁷⁴
	182	22	164	21	160	24	282	26
27.2	37.446	22.36	8.323	54.97	4.789	48.96	63.128	50.82
Nov. 6.2	37.280 ¹⁶⁶	22.46 ¹⁰	8.169 ¹⁵⁴	54.54 ⁴³	4.640 ¹⁴⁹	49.33 ³⁷	62.854 ²⁷⁴	50.55 ²⁷
16.2	37.135 ¹⁴⁵	22.42 ⁴	8.035 ¹³⁴	53.88 ⁶⁶	4.509 ¹³¹	49.84 ⁵¹	62.599 ²⁵⁵	49.77 ⁷⁸
26.2	37.023 ¹¹²	22.23 ¹⁹	7.928 ¹⁰⁷	53.02 ⁸⁶	4.405 ¹⁰⁴	50.49 ⁶⁵	62.370 ²²⁹	48.49 ¹²⁸
Dec. 6.1	36.947 ⁷⁶	21.91 ³²	7.852 ⁷⁶	51.98 ¹⁰⁴	4.331 ⁷⁴	51.25 ⁷⁶	62.177 ¹⁹³	46.74 ¹⁷⁵
	34	42	43	121	42	85	152	217
16.1	36.913	21.49	7.809	50.77	4.289	52.10	62.025	44.57
26.1	36.923 ¹⁰	20.98 ⁵¹	7.803 ⁶	49.44 ¹³³	4.285 ⁴	53.02 ⁹²	61.921 ¹⁰⁴	42.03 ²⁵⁴
36.1	36.976 ⁵³	20.38 ⁶⁰	7.835 ³²	48.03 ¹⁴¹	4.317 ³²	53.99	61.868 ⁵³	39.24 ²⁷⁹
Mean Place	33.406	29.64	5.136	35.37	1.371	66.48	61.132	20.71
Sec δ , Tan δ	1.132	-0.530	1.008	+0.124	1.000	-0.019	1.452	+1.053
$D\alpha$, $D_{\alpha}\alpha$	+0.07	+0.02	+0.06	0.00	+0.06	0.00	+0.04	-0.04
$D\delta$, $D_{\delta}\delta$	+0.2	-0.9	+0.2	-0.9	+0.2	-0.9	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cephei. Mag. 4.4		γ Vulpeculæ. Mag. 5.4		α^2 Capricorni. Mag. 3.8		β Capricorni. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 11	° ' " +77 27	h m 20 13	° ' " +24 24	h m 20 13	° ' " -12 47	h m 20 16	° ' " -15 2
	s	"	s	"	s	"	s	"
Jan. 1.1	35.66	51.93	13.439	56.29	26.889	72.49	20.858	41.69
11.0	35.32	48.85	13.465	54.08	26.947	72.73	20.914	41.81
21.0	35.14	45.59	13.530	51.82	27.040	72.94	21.006	41.86
31.0	35.16	42.27	13.632	49.61	27.168	73.06	21.132	41.83
Feb. 10.0	35.38	39.01	13.770	47.54	27.327	73.07	21.290	41.70
19.9	35.78	35.95	13.943	45.70	27.513	72.95	21.477	41.42
Mar. 1.9	36.36	33.21	14.148	44.19	27.727	72.66	21.691	41.02
11.9	37.08	30.89	14.381	43.06	27.964	72.28	21.928	40.45
21.8	37.92	29.09	14.641	42.37	28.224	71.55	22.188	39.70
31.8	38.86	27.87	14.922	42.15	28.502	70.72	22.467	38.80
Apr. 10.8	39.87	27.28	15.221	42.43	28.795	69.72	22.763	37.75
20.8	40.90	27.34	15.531	43.20	29.101	68.56	23.069	36.56
30.7	41.93	28.03	15.846	44.42	29.413	67.29	23.384	35.29
May 10.7	42.91	29.32	16.161	46.06	29.727	65.93	23.700	33.94
20.7	43.83	31.17	16.467	48.07	30.036	64.52	24.013	32.59
30.7	44.66	33.53	16.760	50.37	30.334	63.12	24.315	31.23
June 9.6	45.36	36.30	17.029	52.92	30.615	61.76	24.600	29.95
19.6	45.92	39.43	17.271	55.62	30.870	60.48	24.859	28.77
29.6	46.34	42.81	17.477	58.41	31.094	59.33	25.089	27.71
July 9.5	46.59	46.37	17.644	61.22	31.283	58.30	25.284	26.79
19.5	46.66	50.01	17.766	63.98	31.430	57.43	25.435	26.05
29.5	46.57	53.66	17.842	66.63	31.532	56.75	25.541	25.48
Aug. 8.5	46.32	57.22	17.871	69.11	31.588	56.22	25.602	25.08
18.4	45.89	60.65	17.854	71.39	31.599	55.86	25.616	24.85
28.4	45.33	63.85	17.793	73.41	31.565	55.67	25.584	24.76
Sept. 7.4	44.63	66.76	17.691	75.14	31.491	55.60	25.513	24.81
17.4	43.80	69.32	17.556	76.58	31.383	55.64	25.405	24.95
27.3	42.89	71.47	17.394	77.67	31.248	55.78	25.272	25.18
Oct. 7.3	41.89	73.16	17.215	78.40	31.095	56.00	25.119	25.45
17.3	40.85	74.36	17.026	78.77	30.933	56.26	24.956	25.75
27.2	39.78	75.03	16.836	78.77	30.772	56.55	24.793	26.06
Nov. 6.2	38.72	75.14	16.655	78.39	30.621	56.86	24.640	26.36
16.2	37.69	74.67	16.491	77.65	30.487	57.18	24.504	26.65
26.2	36.72	73.63	16.350	76.54	30.380	57.51	24.395	26.92
Dec. 6.1	35.84	72.05	16.240	75.11	30.304	57.84	24.316	27.17
16.1	35.07	69.96	16.164	73.38	30.262	58.17	24.271	27.39
26.1	34.45	67.42	16.124	71.41	30.257	58.48	24.264	27.58
36.1	33.98	64.51	16.123	69.25	30.289	58.77	24.295	27.73
Mean Place	42.531	43.18	14.008	53.00	27.046	70.54	21.000	39.49
Sec δ , Tan δ	4.607	+4.497	1.098	+0.454	1.026	-0.227	1.035	-0.269
D ϕ α , D α α	-0.04	-0.16	+0.05	-0.02	+0.07	+0.01	+0.07	+0.01
D ϕ δ , D α δ	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pavonis. Mag. 2.1		γ Cygni. Mag. 2.3		π Capricorni. Mag. 5.2		ρ Capricorni. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 19	° ' " -56 59	h m 20 19	° ' " +39 59	h m 20 22	° ' " -18 28	h m 20 24	° ' " -18 5
Jan. 1.1	4.805	74.37	13.961	31.33	34.193	66.92	7.574	22.58
11.0	4.858	72.05	13.951	28.62	34.244	66.82	7.623	22.51
21.0	4.978	69.61	13.988	25.81	34.332	66.65	7.709	22.36
31.0	5.163	67.11	14.072	22.99	34.455	66.38	7.830	22.11
Feb. 10.0	5.407	64.60	14.203	20.29	34.610	66.01	7.982	21.76
19.9	5.707	62.14	14.377	17.83	34.793	65.53	8.164	21.29
Mar. 1.9	6.056	59.77	14.593	15.71	35.006	64.91	8.374	20.69
11.9	6.449	57.54	14.846	14.01	35.243	64.15	8.609	19.94
21.9	6.881	55.50	15.132	12.81	35.504	63.26	8.868	19.06
31.8	7.344	53.66	15.447	12.16	35.785	62.23	9.147	18.04
Apr. 10.8	7.834	52.07	15.782	12.08	36.083	61.08	9.443	16.88
20.8	8.341	50.76	16.132	12.59	36.394	59.84	9.754	15.63
30.7	8.858	49.75	16.487	13.64	36.714	58.53	10.072	14.32
May 10.7	9.377	49.07	16.840	15.22	37.036	57.20	10.394	12.97
20.7	9.886	48.74	17.183	17.27	37.356	55.88	10.713	11.64
30.7	10.375	48.76	17.507	19.73	37.665	54.60	11.022	10.35
June 9.6	10.833	49.14	17.803	22.51	37.958	53.42	11.316	9.15
19.6	11.249	49.86	18.064	25.55	38.227	52.36	11.585	8.05
29.6	11.614	50.90	18.284	28.75	38.466	51.44	11.824	7.11
July 9.6	11.918	52.22	18.457	32.04	38.668	50.70	12.026	6.35
19.5	12.152	53.80	18.580	35.34	38.828	50.13	12.187	5.75
29.5	12.311	55.56	18.649	38.57	38.943	49.75	12.304	5.34
Aug. 8.5	12.391	57.45	18.664	41.66	39.011	49.55	12.373	5.12
18.4	12.391	59.40	18.626	44.56	39.031	49.50	12.394	5.04
28.4	12.315	61.33	18.538	47.19	39.006	49.60	12.370	5.12
Sept. 7.4	12.167	63.16	18.404	49.53	38.939	49.82	12.304	5.31
17.4	11.957	64.81	18.231	51.51	38.835	50.12	12.202	5.60
27.3	11.695	66.22	18.027	53.10	38.702	50.47	12.070	5.95
Oct. 7.3	11.395	67.30	17.802	54.26	38.549	50.85	11.918	6.32
17.3	11.074	68.01	17.563	54.98	38.384	51.22	11.753	6.69
27.3	10.748	68.31	17.321	55.23	38.219	51.57	11.589	7.05
Nov. 6.2	10.434	68.19	17.085	55.00	38.062	51.87	11.432	7.36
16.2	10.147	67.63	16.866	54.29	37.922	52.11	11.292	7.61
26.2	9.902	66.67	16.670	53.12	37.808	52.31	11.177	7.82
Dec. 6.1	9.708	65.31	16.506	51.50	37.724	52.44	11.092	7.97
16.1	9.577	63.61	16.379	49.48	37.673	52.52	11.041	8.06
26.1	9.511	61.64	16.234	47.14	37.661	52.53	11.027	8.10
36.1	9.516	59.43	16.253	44.53	37.686	52.48	11.051	8.07
Mean Place	5.338	67.87	14.948	25.47	34.314	64.29	7.690	20.02
Sec δ , Tan δ	1.836	-1.540	1.305	+0.839	1.054	-0.334	1.052	-0.327
$D\psi\alpha$, $D_\alpha\alpha$	+0.09	+0.06	+0.04	-0.03	+0.07	+0.01	+0.07	+0.01
$D\psi\delta$, $D_\alpha\delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Cygni. Mag. 4.1			θ Cephei. Mag. 4.3			ϵ Delphini. Mag. 4.0			Groombridge 3241. Mag. 6.4		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 20 25	s +30 5	° ' "	h m 20 28	s +62 42	° ' "	h m 20 29	s +11 1	° ' "	h m 20 30	s +72 14	° ' "
Jan. 1.1	59.639		32.45	9.00		62.60	14.572		15.52	18.15		72.41
11.0	59.644	5	30.09	8.87	13	59.57	14.599	27	13.99	17.89	26	69.42
21.0	59.687	43	27.65	8.82	3	56.36	14.660	61	12.43	17.74	15	66.21
31.0	59.772	85	25.22	8.85	3	53.08	14.754	94	10.93	17.73	13	62.90
Feb. 10.0	59.896	124	22.91	8.97	12	49.86	14.882	128	9.56	17.86	1	59.62
		162			21			158			26	
19.9	60.058		20.82	9.18		46.83	15.040		8.39	18.12		56.50
Mar. 1.9	60.255	197	19.04	9.47	29	44.11	15.227	187	7.47	18.50	38	53.65
11.9	60.484	229	17.66	9.82	35	41.81	15.442	215	6.87	18.99	49	51.21
21.9	60.744	260	16.73	10.24	42	40.01	15.681	239	6.63	19.57	58	49.26
31.8	61.027	283	16.29	10.71	47	38.79	15.943	262	6.77	20.23	66	47.89
		306			50			279			72	
Apr. 10.8	61.332		16.37	11.21		38.19	16.222		7.29	20.95		47.12
20.8	61.650	318	16.98	11.73	52	38.25	16.516	294	8.19	21.70	75	46.99
30.7	61.977	327	18.09	12.26	53	38.93	16.819	303	9.45	22.46	76	47.52
May 10.7	62.304	327	19.66	12.79	53	40.22	17.125	306	11.02	23.21	75	48.65
20.7	62.625	321	21.64	13.30	51	42.08	17.426	301	12.84	23.92	71	50.36
		306			47			293			65	
30.7	62.931		23.97	13.77		44.43	17.719		14.89	24.57		52.59
June 9.6	63.216	285	26.59	14.19	42	47.22	17.994	275	17.08	25.15	58	55.28
19.6	63.471	255	29.41	14.54	35	50.37	18.244	250	19.35	25.64	49	58.34
29.6	63.690	219	32.36	14.84	30	53.77	18.465	221	21.66	26.02	38	61.69
July 9.6	63.869	179	35.36	15.05	21	57.36	18.651	186	23.93	26.28	26	65.25
		134			14			145			16	
19.5	64.003		38.36	15.19		61.03	18.796		26.11	26.44		68.93
29.5	64.039	86	41.27	15.24	5	64.71	18.897	101	28.16	26.46	2	72.64
Aug. 8.5	64.126	37	44.04	15.21	3	68.32	18.954	57	30.06	26.37	9	76.31
		11		15.10	11	71.77	18.966	12	31.75	26.16	21	79.84
18.4	64.115	58	46.60	14.90	20	75.01	18.935	31	33.22	25.84	32	83.18
28.4	64.067	101	48.92		27			71			43	
Sept. 7.4	63.956		50.95	14.63		77.95	18.864		34.44	25.41		86.25
17.4	63.821	135	52.65	14.31	32	80.54	18.759	105	35.42	24.89	52	88.98
27.3	63.656	165	54.01	13.94	37	82.73	18.628	131	36.13	24.29	60	91.35
Oct. 7.3	63.469	187	54.99	13.52	42	84.46	18.477	151	36.59	23.64	65	93.25
17.3	63.271	198	55.57	13.08	44	85.70	18.316	161	36.78	22.94	70	94.65
		202			46			164			72	
27.3	63.069		55.74	12.62		86.40	18.152		36.71	22.22		95.53
Nov. 6.2	62.872	197	55.49	12.17	45	86.55	17.994	158	36.37	21.50	72	95.85
16.2	62.690	182	54.83	11.73	41	86.14	17.850	144	35.79	20.79	71	95.59
26.2	62.531	159	53.77	11.32	44	85.14	17.728	122	34.96	20.11	62	94.75
Dec. 6.1	62.400	131	52.34	10.95	37	83.61	17.632	96	33.91	19.49	68	93.34
		100			32			66			53	
16.1	62.300		50.56	10.63		81.58	17.566		32.66	18.96		91.41
26.1	62.238	62	48.49	10.38	25	79.09	17.534	32	31.27	18.51	45	89.01
36.1	62.215	23	46.21	10.21	17	76.25	17.536	2	29.77	18.17	34	86.22
Mean Place	60.298		27.48	11.516		53.24	14.877		13.40	22.523		62.00
Sec δ , Tan δ	1.156		+0.579	2.181		+1.939	1.019		+0.195	3.280		+3.124
$D\delta$, $D\alpha$	+0.05		-0.02	+0.02		-0.08	+0.06		-0.01	0.00		-0.13
$D\delta$, $D\alpha$	+0.2		-0.8	+0.2		-0.8	+0.2		-0.8	+0.2		-0.8

APPARENT PLACES OF STARS, 1917.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Indi. Mag. 3.2		β Delphini. Mag. 3.7		ν Capricorni. Mag. 5.3		α Delphini. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 31	° ' " -47 34	h m 20 33	° ' " +14 18	h m 20 35	° ' " -18 25	h m 20 35	° ' " +15 37
	s	"	s	"	s	"	s	"
Jan. 1.1	43.698	61.44	39.118	23.33	19.518	56.01	46.640	10.82
11.1	43.737	59.63	39.138	21.64	19.557	55.91	46.657	9.09
21.0	43.828	57.68	39.192	19.93	19.631	55.70	46.707	7.32
31.0	43.971	55.64	39.280	18.28	19.740	55.41	46.792	5.59
Feb. 10.0	44.161	53.52	39.402	16.73	19.880	55.01	46.911	3.99
19.9	44.394	51.40	39.555	15.38	20.051	54.48	47.062	2.58
Mar. 1.9	44.668	49.31	39.738	14.31	20.251	53.81	47.243	1.44
11.9	44.979	47.27	39.950	13.56	20.477	53.00	47.454	0.63
21.9	45.323	45.32	40.187	13.18	20.729	52.04	47.690	0.20
31.8	45.695	43.49	40.449	13.19	21.001	50.94	47.951	0.18
Apr. 10.8	46.092	41.82	40.729	13.63	21.293	49.72	48.231	0.57
20.8	46.507	40.34	41.025	14.47	21.602	48.41	48.526	1.38
30.8	46.934	39.09	41.329	15.69	21.920	47.03	48.832	2.59
May 10.7	47.366	38.08	41.637	17.26	22.243	45.62	49.142	4.15
20.7	47.794	37.36	41.942	19.11	22.566	44.22	49.448	6.00
30.7	48.210	36.92	42.237	21.21	22.881	42.88	49.744	8.12
June 9.6	48.604	36.80	42.515	23.47	23.180	41.62	50.024	10.42
19.6	48.967	36.99	42.769	25.86	23.458	40.60	50.280	12.84
29.6	49.289	37.48	42.994	28.29	23.705	39.52	50.506	15.32
July 9.6	49.563	38.27	43.182	30.71	23.917	38.72	50.695	17.80
19.5	49.782	39.30	43.329	33.06	24.089	38.12	50.844	20.21
29.5	49.940	40.56	43.433	35.29	24.216	37.69	50.949	22.51
Aug. 8.5	50.032	41.99	43.492	37.35	24.296	37.47	51.009	24.65
18.5	50.060	43.51	43.506	39.23	24.328	37.41	51.024	26.60
28.4	50.024	45.08	43.476	40.87	24.313	37.50	50.995	28.32
Sept. 7.4	49.927	46.63	43.406	42.27	24.256	37.74	50.926	29.79
17.4	49.778	48.09	43.303	43.40	24.162	38.06	50.822	30.98
27.3	49.586	49.38	43.172	44.26	24.036	38.44	50.690	31.90
Oct. 7.3	49.361	50.45	43.020	44.82	23.889	38.85	50.538	32.51
17.3	49.117	51.24	42.855	45.09	23.729	39.27	50.372	32.83
27.3	48.866	51.71	42.689	45.09	23.566	39.67	50.204	32.86
Nov. 6.2	48.622	51.83	42.528	44.79	23.408	40.02	50.042	32.57
16.2	48.399	51.60	42.380	44.20	23.265	40.31	49.892	31.99
26.2	48.206	51.02	42.253	43.35	23.145	40.53	49.761	31.14
Dec. 6.2	48.055	50.12	42.150	42.25	23.054	40.70	49.656	30.02
16.1	47.951	48.90	42.078	40.93	22.996	40.79	49.581	28.67
26.1	47.898	47.43	42.039	39.42	22.973	40.82	49.538	27.13
36.1	47.899	45.74	42.033	37.79	22.984	40.77	49.530	25.44
Mean Place	43.960	55.24	39.453	20.44	19.605	53.45	46.988	7.61
Sec δ , Tan δ	1.482	-1.094	1.032	+0.255	1.054	-0.333	1.038	+0.280
$D_\alpha \alpha$, $D_\alpha \alpha$	+0.08	+0.04	+0.06	-0.01	+0.07	+0.01	+0.06	-0.01
$D_\delta \delta$, $D_\delta \delta$	+0.2	-0.8	+0.2	-0.8	+0.2	-0.8	+0.3	-0.8

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Pavonis. Mag. 3.6		α Cygni. (Deneb.) Mag. 1.3		δ Delphini. Mag. 4.5		ψ Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 37	° ' " -66 29	h m 20 38	° ' " +44 58	h m 20 39	° ' " +14 46	h m 20 41	° ' " -25 33
Jan. 1.1	28.78	77.64	35.010	67.56	34.722	36.84	10.984	74.82
11.1	28.77	74.90	34.963	64.84	34.736	35.16	11.018	74.29
21.0	28.85	71.99	34.966	61.97	34.783	33.45	11.090	73.65
31.0	29.02	69.00	35.020	59.05	34.865	31.78	11.197	72.89
Feb. 10.0	29.28	65.99	35.124	56.20	34.981	30.22	11.338	72.04
19.9	29.62	63.02	35.279	53.55	35.128	28.86	11.511	71.07
Mar. 1.9	30.04	60.17	35.482	51.18	35.306	27.76	11.715	70.00
11.9	30.52	57.50	35.729	49.23	35.513	26.99	11.947	68.82
21.9	31.06	55.04	36.016	47.76	35.746	26.59	12.205	67.55
31.8	31.64	52.85	36.336	46.84	36.004	26.57	12.487	66.21
Apr. 10.8	32.26	50.96	36.685	46.49	36.281	26.97	12.790	64.80
20.8	32.92	49.42	37.052	46.73	36.574	27.78	13.109	63.39
30.8	33.59	48.26	37.430	47.55	36.879	28.98	13.440	61.97
May 10.7	34.27	47.49	37.809	48.93	37.187	30.52	13.777	60.59
20.7	34.94	47.14	38.181	50.82	37.492	32.37	14.114	59.30
30.7	35.59	47.22	38.534	53.16	37.790	34.46	14.445	58.13
June 9.6	36.20	47.70	38.862	55.88	38.072	36.74	14.760	57.09
19.6	36.76	48.59	39.153	58.90	38.329	39.12	15.053	56.24
29.6	37.26	49.87	39.402	62.13	38.559	41.58	15.317	55.60
July 9.6	37.66	51.48	39.603	65.50	38.751	44.03	15.544	55.16
19.5	37.99	53.38	39.750	68.93	38.904	46.40	15.730	54.94
29.5	38.22	55.51	39.839	72.34	39.014	48.67	15.869	54.93
Aug. 8.5	38.35	57.78	39.872	75.65	39.078	50.77	15.958	55.12
18.5	38.36	60.13	39.849	78.78	39.097	52.69	15.998	55.47
28.4	38.27	62.46	39.770	81.70	39.072	54.37	15.989	55.97
Sept. 7.4	38.09	64.68	39.641	84.32	39.007	55.82	15.933	56.56
17.4	37.82	66.70	39.469	86.60	38.908	56.98	15.839	57.21
27.3	37.47	68.44	39.260	88.51	38.779	57.88	15.710	57.87
Oct. 7.3	37.06	69.82	39.024	89.99	38.630	58.48	15.558	58.51
17.3	36.61	70.77	38.770	91.02	38.467	58.79	15.388	59.08
27.3	36.14	71.25	38.508	91.56	38.301	58.82	15.215	59.57
Nov. 6.2	35.68	71.21	38.249	91.60	38.140	58.55	15.048	59.94
16.2	35.24	70.66	38.000	91.14	37.990	57.99	14.894	60.15
26.2	34.85	69.61	37.772	90.17	37.859	57.16	14.763	60.24
Dec. 6.2	34.52	68.10	37.573	88.72	37.754	56.08	14.661	60.19
16.1	34.27	66.16	37.409	86.84	37.678	54.77	14.594	59.98
26.1	34.11	63.87	37.285	84.57	37.633	53.28	14.562	59.66
36.1	34.03	61.28	37.207	81.98	37.623	51.65	14.569	59.21
Mean Place	29.681	69.90	36.119	59.39	35.044	33.59	11.051	71.19
Sec δ , Tan δ	2.508	-2.300	1.414	+1.000	1.034	+0.264	1.109	-0.478
$D\psi\alpha$, $D\omega\alpha$	+0.11	+0.10	+0.04	-0.04	+0.06	-0.01	+0.07	+0.02
$D\psi\delta$, $D\omega\delta$	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Delphini seq. Mag. 4.5		ϵ Cygni. Mag. 2.6		ϵ Aquarii. Mag. 3.8		η Cephei. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 42	° ' " +15 49	h m 20 42	° ' " +33 39	h m 20 43	° ' " - 9 47	h m 20 43	° ' " +61 30
Jan. 1.1	48.119	31.79	50.479	38.22	10.963	62.21	33.96	68.78
11.1	48.129	30.07	50.460	35.84	10.992	62.60	33.82	65.92
21.0	48.172	28.31	50.482	33.33	11.054	62.92	33.75	62.80
31.0	48.250	26.59	50.545	30.81	11.147	63.15	33.76	59.59
Feb. 10.0	48.362	24.99	50.650	28.37	11.273	63.26	33.85	56.41
19.9	48.505	23.56	50.795	26.12	11.429	63.22	34.02	53.38
Mar. 1.9	48.681	22.41	50.978	24.17	11.612	62.99	34.26	50.61
11.9	48.886	21.58	51.198	22.60	11.823	62.58	34.59	48.24
21.9	49.117	21.11	51.452	21.47	12.058	61.94	34.97	46.37
31.8	49.374	21.06	51.734	20.84	12.317	61.10	35.41	45.04
Apr. 10.8	49.651	21.42	52.041	20.74	12.595	60.05	35.89	44.31
20.8	49.944	22.20	52.366	21.18	12.889	58.81	36.39	44.20
30.8	50.249	23.38	52.702	22.15	13.196	57.42	36.91	44.76
May 10.7	50.559	24.91	53.042	23.60	13.508	55.92	37.43	45.91
20.7	50.867	26.74	53.378	25.50	13.821	54.34	37.93	47.64
30.7	51.165	28.84	53.702	27.79	14.126	52.73	38.40	49.89
June 9.6	51.449	31.13	54.004	30.40	14.418	51.14	38.83	52.58
19.6	51.709	33.55	54.279	33.24	14.689	49.61	39.21	55.64
29.6	51.941	36.03	54.518	36.27	14.932	48.19	39.52	58.99
July 9.6	52.136	38.51	54.716	39.38	15.142	46.90	39.76	62.56
19.5	52.291	40.94	54.869	42.51	15.312	45.78	39.93	66.24
29.5	52.403	43.27	54.973	45.58	15.440	44.84	40.02	69.95
Aug. 8.5	52.470	45.44	55.026	48.54	15.522	44.09	40.02	73.62
18.5	52.492	47.41	55.029	51.33	15.559	43.52	39.95	77.16
28.4	52.470	49.15	54.983	53.88	15.551	43.14	39.79	80.51
Sept. 7.4	52.407	50.65	54.893	56.16	15.502	42.93	39.57	83.58
17.4	52.309	51.87	54.764	58.11	15.416	42.87	39.29	86.34
27.3	52.181	52.81	54.603	59.71	15.300	42.94	38.96	88.70
Oct. 7.3	52.032	53.46	54.418	60.93	15.163	43.11	38.58	90.63
17.3	51.869	53.81	54.217	61.74	15.012	43.38	38.17	92.07
27.3	51.702	53.86	54.010	62.13	14.857	43.70	37.75	92.99
Nov. 6.2	51.540	53.61	53.806	62.08	14.707	44.08	37.32	93.37
16.2	51.389	53.07	53.612	61.60	14.569	44.49	36.90	93.17
26.2	51.256	52.24	53.437	60.68	14.452	44.92	36.51	92.41
Dec. 6.2	51.148	51.14	53.287	59.35	14.359	45.37	36.15	91.10
16.1	51.068	49.82	53.169	57.65	14.298	45.83	35.84	89.26
26.1	51.019	48.30	53.085	55.62	14.269	46.28	35.58	86.96
36.1	51.005	46.63	53.039	53.34	14.272	46.70	35.39	84.27
Mean Place	48.447	28.19	51.169	31.48	11.054	61.17	36.226	58.03
Sec δ , Tan δ	1.039	+0.283	1.201	+0.666	1.015	-0.173	2.097	+1.843
$D\alpha$, D_α	+0.06	-0.01	+0.05	-0.03	+0.06	+0.01	+0.02	-0.06
$D\delta$, D_δ	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8	+0.3	-0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aquarii. Mag. 4.8		β Indi. Mag. 3.7		γ Vulpeculæ. Mag. 5.2		γ H ¹ . Draconis. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 48 s	° ' " - 9 17 "	h m 20 48 s	° ' " -58 45 "	h m 20 51 s	° ' " +27 44 "	h m 20 51 s	° ' " +80 14 "
Jan. 1.1	10.627	45.05	19.513	72.65	0.827	35.18	15.39	43.46
11.1	10.652	45.46	19.507	70.30	0.811	33.01	14.72	40.73
21.0	10.709	45.80	19.569	67.76	0.833	30.76	14.27	37.70
31.0	10.797	46.04	19.698	65.10	0.893	28.49	14.06	34.49
Feb. 10.0	10.918	46.17	19.893	62.37	0.989	26.31	14.09	31.24
20.0	11.069	46.15	20.147	59.65	1.123	24.31	14.38	28.05
Mar. 1.9	11.247	45.93	20.458	56.97	1.294	22.59	14.90	25.09
11.9	11.454	45.53	20.820	54.41	1.499	21.21	15.64	22.42
21.9	11.685	44.90	21.228	52.00	1.735	20.25	16.56	20.21
31.8	11.940	44.06	21.677	49.78	2.001	19.76	17.64	18.50
Apr. 10.8	12.215	43.01	22.160	47.81	2.290	19.78	18.85	17.37
20.8	12.507	41.77	22.670	46.10	2.599	20.28	20.13	16.88
30.8	12.812	40.37	23.198	44.71	2.920	21.27	21.43	16.97
May 10.7	13.123	38.85	23.735	43.68	3.246	22.70	22.73	17.72
20.7	13.435	37.24	24.271	43.01	3.571	24.55	23.97	19.07
30.7	13.741	35.61	24.794	42.72	3.887	26.76	25.12	20.95
June 9.7	14.035	33.99	25.292	42.82	4.185	29.25	26.15	23.32
19.6	14.309	32.42	25.753	43.30	4.459	31.95	27.03	26.10
29.6	14.555	30.95	26.167	44.16	4.700	34.79	27.72	29.23
July 9.6	14.767	29.62	26.522	45.36	4.903	37.71	28.23	32.63
19.5	14.942	28.46	26.808	46.85	5.064	40.63	28.53	36.21
29.5	15.074	27.47	27.020	48.61	5.179	43.49	28.63	39.89
Aug. 8.5	15.161	26.67	27.149	50.54	5.245	46.23	28.51	43.61
18.5	15.203	26.07	27.195	52.59	5.264	48.78	28.18	47.24
28.4	15.201	25.65	27.159	54.69	5.236	51.12	27.66	50.73
Sept. 7.4	15.156	25.42	27.046	56.73	5.165	53.19	26.94	54.01
17.4	15.074	25.34	26.860	58.64	5.056	54.96	26.07	57.04
27.4	14.961	25.39	26.614	60.33	4.916	56.40	25.04	59.71
Oct. 7.3	14.827	25.55	26.320	61.74	4.751	57.49	23.88	61.99
17.3	14.679	25.82	25.995	62.78	4.571	58.20	22.64	63.82
27.3	14.525	26.15	25.654	63.42	4.384	58.53	21.33	65.14
Nov. 6.2	14.375	26.53	25.315	63.60	4.199	58.47	19.98	65.89
16.2	14.237	26.95	24.994	63.34	4.023	58.02	18.64	66.09
26.2	14.118	27.41	24.706	62.62	3.865	57.18	17.33	65.69
Dec. 6.2	14.023	27.88	24.464	61.46	3.728	55.97	16.09	64.72
16.1	13.958	28.35	24.279	59.91	3.621	54.42	14.98	63.19
26.1	13.925	28.81	24.156	58.01	3.546	52.59	14.00	61.14
36.1	13.924	29.25	24.100	55.81	3.505	50.52	13.21	58.62
Mean Place	10.706	44.18	19.977	64.98	1.338	28.91	23.721	30.34
Sec δ , Tan δ	1.013	-0.164	1.929	-1.649	1.130	+0.526	5.902	+5.817
$D\mu\alpha$, $D\alpha\alpha$	+0.06	+0.01	+0.09	+0.07	+0.05	-0.02	-0.05	-0.26
$D\mu\delta$, $D\alpha\delta$	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cygni. Mag. 4.0			α Octantis. Mag. 5.2			γ Microscopii. Mag. 4.7			θ Capricorni. Mag. 4.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	20 54		+40 50	20 54		-77 20	20 56		-32 34	21 1		-17 33
Jan. 1.1	3.822	51	57.96	40.26	18	40.25	12.222	63.38	16.993	50.79	7	
11.1	3.771	5	55.42	40.08	1	37.15	12.239	62.45	17.007	50.72	14	
21.0	3.766	5	52.73	40.07	1	33.84	12.294	61.37	17.053	50.55	17	
31.0	3.806	40	49.98	40.24	17	30.43	12.387	60.14	17.134	50.25	30	
Feb. 10.0	3.893	87	47.28	40.56	32	26.98	12.519	58.80	17.247	49.83	42	
20.0	4.026	133	44.75	41.04	48	23.58	12.685	57.36	17.390	49.26	57	
Mar. 1.9	4.204	178	42.49	41.67	63	20.32	12.885	55.84	17.563	48.54	72	
11.9	4.424	220	40.59	42.42	75	17.26	13.116	54.24	17.766	47.67	87	
21.9	4.684	260	39.14	43.29	87	14.46	13.377	52.59	17.995	46.64	108	
31.9	4.979	295	38.22	44.25	96	11.97	13.664	50.93	18.250	45.44	120	
Apr. 10.8	5.302	323	37.84	45.30	105	9.84	13.976	49.27	18.527	44.12	132	
20.8	5.647	345	38.03	46.40	110	8.11	14.308	47.66	18.824	42.69	143	
30.8	6.005	358	38.78	47.54	114	6.83	14.656	46.11	19.136	41.18	151	
May 10.7	6.369	364	40.07	48.70	116	6.00	15.012	44.67	19.457	39.63	155	
20.7	6.730	361	41.86	49.84	114	5.65	15.370	43.38	19.781	38.08	155	
30.7	7.078	348	44.08	50.96	112	5.78	15.723	42.28	20.101	36.57	151	
June 9.7	7.405	327	46.68	52.02	106	6.39	16.064	41.38	20.410	35.14	143	
19.6	7.701	296	49.57	52.98	96	7.45	16.384	40.72	20.701	33.84	130	
29.6	7.960	259	52.69	53.84	86	8.94	16.674	40.31	20.965	32.71	113	
July 9.6	8.175	215	55.95	54.57	73	10.82	16.928	40.16	21.198	31.75	96	
19.5	8.341	166	59.27	55.15	58	13.02	17.136	40.26	21.392	31.01	74	
29.5	8.455	114	62.58	55.56	41	15.47	17.298	40.61	21.543	30.46	55	
Aug. 8.5	8.514	59	65.80	55.79	23	18.10	17.408	41.18	21.647	30.12	34	
18.5	8.520	6	68.87	55.83	4	20.82	17.465	41.93	21.704	30.00	12	
28.4	8.473	47	71.73	55.70	13	23.51	17.470	42.80	21.715	30.04	4	
Sept. 7.4	8.377	96	74.32	55.38	32	26.09	17.425	43.76	21.682	30.25	21	
17.4	8.238	139	76.59	54.88	50	28.47	17.334	44.76	21.608	30.57	32	
27.4	8.063	175	78.52	54.25	63	30.52	17.206	45.75	21.501	30.99	42	
Oct. 7.3	7.860	203	80.03	53.50	75	32.17	17.048	46.66	21.370	31.46	47	
17.3	7.638	222	81.11	52.66	84	33.34	16.872	47.45	21.222	31.95	49	
27.3	7.405	233	81.74	51.76	90	33.98	16.687	48.07	21.065	32.43	48	
Nov. 6.2	7.172	233	81.90	50.86	90	34.07	16.504	48.51	20.909	32.88	45	
16.2	6.948	224	81.57	49.98	88	33.54	16.334	48.73	20.764	33.28	40	
26.2	6.741	207	80.76	49.16	82	32.44	16.183	48.73	20.637	33.61	33	
Dec. 6.2	6.556	185	79.49	48.43	73	30.79	16.061	48.51	20.533	33.86	25	
16.1	6.402	154	77.79	47.83	60	28.64	15.972	48.08	20.458	34.04	18	
26.1	6.285	117	75.71	47.39	44	26.07	15.920	47.43	20.414	34.13	9	
36.1	6.207	78	73.33	47.09	30	23.15	15.907	46.63	20.403	34.13	0	
Mean Place	4.689		49.17	42.416		31.45	12.259	58.56	17.001	48.54		
Sec δ , Tan δ	1.322		+0.865	4.563		-4.452	1.187	-0.639	1.049	-0.316		
$D\psi\alpha$, $D\omega\alpha$	+0.04		-0.04	+0.15		+0.20	+0.07	+0.03	+0.07	+0.02		
$D\psi\delta$, $D\omega\delta$	+0.3		-0.7	+0.3		-0.7	+0.3	-0.7	+0.3	-0.7		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Cygni. Mag. 3.9		δ Cygni pr. Mag. 5.6		γ Aquarii. Mag. 4.5		Bradley 2777. Mag. 5.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 1	° ' " +43 35	h m 21 3	° ' " +38 20	h m 21 5	° ' " -11 42	h m 21 7	° ' " +77 47
Jan. 1.1	53.744	56.51	9.717	34.95	4.434	31.09	5.06	38.68
11.1	53.678	53.98	9.679	32.63	4.444	31.33	4.49	36.06
21.0	53.656	51.26	9.683	30.14	4.485	31.51	4.09	33.10
31.0	53.683	48.46	9.729	27.59	4.558	31.58	3.88	29.93
Feb. 10.0	53.758	45.69	9.820	25.09	4.663	31.52	3.85	26.67
20.0	53.882	43.06	9.955	22.74	4.797	31.29	4.03	23.45
Mar. 1.9	54.054	40.68	10.133	20.67	4.961	30.91	4.40	20.41
11.9	54.271	38.66	10.353	18.95	5.154	30.33	4.94	17.66
21.9	54.532	37.09	10.611	17.66	5.374	29.54	5.65	15.31
31.9	54.830	36.02	10.902	16.88	5.619	28.56	6.49	13.47
Apr. 10.8	55.158	35.50	11.224	16.63	5.889	27.38	7.44	12.18
20.8	55.512	35.57	11.567	16.93	6.177	26.04	8.46	11.50
30.8	55.881	36.20	11.926	17.78	6.481	24.55	9.52	11.46
May 10.7	56.257	37.38	12.291	19.16	6.794	22.97	10.58	12.03
20.7	56.631	39.08	12.655	21.02	7.112	21.32	11.62	13.21
30.7	56.994	41.24	13.007	23.31	7.426	19.67	12.60	14.95
June 9.7	57.334	43.80	13.341	25.96	7.728	18.07	13.50	17.20
19.6	57.644	46.67	13.647	28.91	8.014	16.53	14.28	19.90
29.6	57.917	49.80	13.917	32.06	8.274	15.11	14.92	22.97
July 9.6	58.146	53.11	14.146	35.34	8.502	13.84	15.42	26.32
19.6	58.323	56.48	14.328	38.69	8.694	12.76	15.76	29.89
29.5	58.447	59.87	14.458	42.02	8.843	11.87	15.92	33.59
Aug. 8.5	58.515	63.19	14.537	45.26	8.947	11.18	15.93	37.34
18.5	58.526	66.38	14.564	48.35	9.005	10.69	15.77	41.05
28.4	58.483	69.36	14.539	51.23	9.018	10.41	15.43	44.65
Sept. 7.4	58.389	72.10	14.466	53.85	8.988	10.29	14.95	48.06
17.4	58.250	74.52	14.351	56.16	8.919	10.33	14.33	51.22
27.4	58.072	76.58	14.202	58.11	8.819	10.50	13.57	54.06
Oct. 7.3	57.863	78.24	14.023	59.68	8.693	10.78	12.72	56.51
17.3	57.634	79.47	13.826	60.83	8.551	11.13	11.78	58.52
27.3	57.392	80.24	13.618	61.54	8.401	11.52	10.78	60.04
Nov. 6.3	57.147	80.53	13.409	61.79	8.251	11.95	9.74	61.01
16.2	56.909	80.31	13.207	61.58	8.111	12.39	8.69	61.41
26.2	56.685	79.60	13.020	60.91	7.988	12.82	7.66	61.22
Dec. 6.2	56.485	78.41	12.856	59.79	7.866	13.24	6.68	60.44
16.1	56.314	76.77	12.720	58.26	7.811	13.63	5.78	59.07
26.1	56.179	74.73	12.617	56.37	7.765	13.99	4.99	57.17
36.1	56.082	72.37	12.552	54.17	7.750	14.29	4.33	54.79
Mean Place	54.674	46.67	10.466	26.13	4.447	30.02	11.200	24.11
Sec δ , Tan δ	1.381	+0.952	1.275	+0.791	1.021	-0.207	4.730	+4.623
$D\psi a$, $D_{\omega} a$	+0.04	-0.05	+0.05	-0.04	+0.06	+0.01	-0.02	-0.22
$D\psi \delta$, $D_{\omega} \delta$	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Piscis Australis. Mag. 5.6		♉ Cygni. Mag. 3.4		♊ Cygni. Mag. 3.8		♋ Equulei. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 8	° ' " -27 57	h m 21 9	° ' " +29 53	h m 21 11	° ' " +37 41	h m 21 11	° ' " + 4 54
	s	"	s	"	s	"	s	"
Jan. 1.1	22.226	34.99	23.696	16.89	27.964	35.61	40.409	17.22
11.1	22.230 ⁴	34.33	23.660 ³⁶	14.77 ²¹²	27.908 ⁵⁶	33.30 ²³¹	40.404 ⁵	16.12 ¹¹⁰
21.1	22.271 ⁴¹	33.53 ⁸⁰	23.659 ¹	12.50 ²²⁷	27.891 ¹⁷	30.81 ²⁴⁹	40.430 ²⁶	15.01 ¹¹¹
31.0	22.349 ⁷⁸	32.58 ⁹⁵	23.697 ³⁸	10.19 ²³¹	27.915 ²⁴	28.24 ²⁵⁷	40.487 ⁵⁷	13.96 ¹⁰⁵
Feb. 10.0	22.462 ¹¹³	31.50 ¹⁰⁸	23.773 ⁷⁶	7.94 ²²⁵	27.984 ⁶⁹	25.70 ²⁵⁴	40.575 ⁸⁸	13.01 ⁹⁵
	145	122	114	209	113	241	119	77
20.0	22.607	30.28	23.887	5.85	28.097	23.29	40.694	12.24
Mar. 1.9	22.786	28.94	24.040	4.00 ¹⁸⁵	28.251 ¹⁵⁴	21.12 ²¹⁷	40.843 ¹⁴⁹	11.68 ⁵⁶
11.9	22.995 ²⁰⁹	27.51 ¹⁴³	24.229 ¹⁸⁹	2.48 ¹⁵²	28.448 ¹⁹⁷	19.30 ¹⁸²	41.023 ¹⁸⁰	11.39 ²⁹
21.9	23.234 ²³⁹	25.99 ¹⁵²	24.454 ²²⁵	1.37 ¹¹¹	28.684 ²³⁶	17.88 ¹⁴²	41.231 ²⁰⁸	11.39 ⁰
31.9	23.502 ²⁶⁸	24.40 ¹⁵⁹	24.711 ²⁵⁷	0.72 ⁶⁵	28.956 ²⁷²	16.96 ⁹²	41.465 ²³⁴	11.72 ³³
	291	164	283	17	303	40	259	65
Apr. 10.8	23.793	22.76	24.994	0.55	29.259	16.56	41.724	12.37
20.8	24.107 ⁸¹⁴	21.11 ¹⁶⁵	25.301 ³⁰⁷	0.89 ³⁴	29.586 ³²⁷	16.68 ¹²	42.002 ²⁷⁸	13.34 ⁹⁷
30.8	24.436 ³²⁹	19.49 ¹⁶²	25.624 ³²³	1.73 ⁸⁴	29.930 ³⁴⁴	17.36 ⁶⁸	42.297 ²⁸⁵	14.62 ¹²⁸
May 10.8	24.777 ³⁴¹	17.93 ¹⁵⁶	25.956 ³³²	3.04 ¹⁸¹	30.284 ³⁵⁴	18.55 ¹¹⁹	42.603 ³⁰⁶	16.16 ¹⁵⁴
20.7	25.123 ³⁴⁶	16.47 ¹⁴⁶	26.290 ³³⁴	4.78 ¹⁷⁴	30.639 ³⁵⁵	20.24 ¹⁶⁹	42.913 ³¹⁰	17.92 ¹⁷⁶
	343	131	327	212	346	211	305	193
30.7	25.466	15.16	26.617	6.90	30.985	22.35	43.218	19.85
June 9.7	25.799 ³³³	14.03 ¹¹³	26.928 ³¹¹	9.32 ²⁴²	31.315 ³³⁰	24.85 ²⁵⁰	43.514 ²⁹⁶	21.89 ²⁰⁴
19.6	26.112 ³¹³	13.09 ⁹⁴	27.218 ²⁹⁰	12.01 ²⁶⁹	31.620 ³⁰⁵	27.62 ²⁷⁷	43.792 ²⁷⁸	24.00 ²¹¹
29.6	26.401 ²⁸⁹	12.39 ⁷⁰	27.477 ²⁵⁹	14.86 ²⁸⁵	31.891 ²⁷¹	30.64 ³⁰²	44.045 ²⁵³	26.09 ²⁰⁹
July 9.6	26.654 ²⁵³	11.93 ⁴⁶	27.699 ²²²	17.82 ²⁹⁶	32.122 ²³¹	33.79 ³¹⁵	44.267 ²²²	28.15 ²⁰⁶
	214	20	180	299	186	323	186	196
19.6	26.868	11.73	27.879	20.81	32.308	37.02	44.453	30.11
29.5	27.036 ¹⁶⁸	11.76 ³	28.013 ¹³⁴	23.76 ²⁹⁵	32.445 ¹³⁷	40.26 ³²⁴	44.598 ¹⁴⁵	31.94 ¹⁸³
Aug. 8.5	27.155 ¹¹⁹	12.03 ²⁷	28.100 ⁸⁷	26.62 ²⁸⁶	32.529 ⁸⁴	43.43 ³¹⁷	44.699 ¹⁰¹	33.58 ¹⁶⁴
18.5	27.223 ⁶⁸	12.50 ⁴⁷	28.137 ²⁷	29.33 ²⁷¹	32.562 ³³	46.45 ³⁰²	44.756 ⁵⁷	35.04 ¹⁴⁶
28.4	27.241 ¹⁸	13.13 ⁶³	28.126 ¹¹	31.82 ²⁴⁹	32.544 ¹⁸	49.28 ²⁸³	44.769 ¹³	36.28 ¹²⁴
	30	77	55	224	67	258	29	103
Sept. 7.4	27.211	13.90	28.071	34.06	32.477	51.86	44.740	37.31
17.4	27.137 ⁷⁴	14.74 ⁸⁴	27.977 ⁹⁴	36.02 ¹⁹⁶	32.368 ¹⁰⁹	54.16 ²³⁰	44.674 ⁶⁶	38.10 ⁷⁹
27.4	27.025 ¹¹²	15.60 ⁸⁶	27.848 ¹²⁹	37.65 ¹⁶³	32.222 ¹⁴⁶	56.10 ¹⁹⁴	44.577 ⁹⁷	38.68 ⁵⁸
Oct. 7.3	26.885 ¹⁴⁰	16.44 ⁸⁴	27.692 ¹⁵⁶	38.92 ¹²⁷	32.046 ¹⁷⁶	57.67 ¹⁵⁷	44.455 ¹²²	39.03 ³⁵
17.3	26.724 ¹⁶¹	17.20 ⁷⁶	27.518 ¹⁷⁴	39.84 ⁹²	31.850 ¹⁹⁶	58.84 ¹¹⁷	44.317 ¹³⁸	39.16 ¹³
	170	66	184	53	209	74	146	6
27.3	26.554	17.86	27.334	40.36	31.641	59.58	44.171	39.10
Nov. 6.3	26.383 ¹⁷¹	18.38 ⁵²	27.147 ¹⁸⁷	40.47 ¹¹	31.429 ²¹²	59.87 ²⁹	44.023 ¹⁴⁸	38.83 ²⁷
16.2	26.221 ¹⁶²	18.74 ³⁶	26.966 ¹⁸¹	40.18 ²⁹	31.221 ²⁰⁸	59.69 ¹⁸	43.881 ¹⁴²	38.39 ⁴⁴
26.2	26.078 ¹⁴³	18.91 ¹⁷	26.800 ¹⁶⁶	39.48 ⁷⁰	31.026 ¹⁹⁵	59.06 ⁶³	43.757 ¹²⁴	37.77 ⁶²
Dec. 6.2	25.959 ¹¹⁹	18.90 ¹	26.652 ¹⁴⁸	38.39 ¹⁰⁹	30.852 ¹⁷⁴	57.98 ¹⁰⁸	43.651 ¹⁰⁶	36.99 ⁷⁸
	91	20	122	143	150	150	83	91
16.1	25.868	18.70	26.530	36.96	30.702	56.48	43.568	36.08
26.1	25.812 ⁵⁶	18.33 ³⁷	26.436 ⁹⁴	35.20 ¹⁷⁶	30.585 ¹¹⁷	54.62 ¹⁸⁶	43.513 ⁵⁵	35.06 ¹⁰²
36.1	25.792 ²⁰	17.79 ⁵⁴	26.376 ⁶⁰	33.18 ²⁰²	30.502 ⁸³	52.45 ²¹⁷	43.486 ²⁷	33.97 ¹⁰⁹
Mean Place	22.207	30.84	24.176	9.03	28.636	26.11	40.506	14.60
Sec δ, Tan δ	1.132	-0.531	1.153	+0.575	1.264	+0.773	1.004	+0.086
D _ψ α, D _α α	+0.07	+0.03	+0.05	-0.03	+0.05	-0.04	+0.06	0.00
D _ψ δ, D _α δ	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Cygni. Mag. 4.3		θ Microscopii. Mag. 4.9		α Cephei. Mag. 2.6		γ Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 14	° ' " +39 2	h m 21 15	° ' " -41 9	h m 21 16	° ' " +62 13	h m 21 17	° ' " -17 10
Jan. 1.1	8.600	57.08	27.274	46.43	33.96	74.84	37.699	81.38
11.1	8.536	54.74	27.260	45.07	33.76	72.21	37.697	81.33
21.1	8.513	52.20	27.290	43.49	33.63	69.29	37.728	81.15
31.0	8.533	49.58	27.362	41.74	33.58	66.17	37.791	80.85
Feb. 10.0	8.596	46.98	27.476	39.85	33.60	63.00	37.885	80.42
20.0	8.704	44.50	27.630	37.87	33.71	59.90	38.011	79.84
Mar. 1.9	8.857	42.27	27.824	35.80	33.90	56.97	38.167	79.08
11.9	9.054	40.36	28.053	33.70	34.17	54.37	38.353	78.17
21.9	9.289	38.88	28.319	31.59	34.51	52.19	38.568	77.08
31.9	9.562	37.88	28.618	29.52	34.92	50.51	38.806	75.84
Apr. 10.8	9.868	37.40	28.945	27.52	35.38	49.39	39.077	74.45
20.8	10.198	37.46	29.298	25.62	35.88	48.89	39.365	72.95
30.8	10.547	38.06	29.670	23.88	36.40	49.00	39.672	71.36
May 10.8	10.905	39.23	30.057	22.33	36.94	49.73	39.989	69.71
20.7	11.265	40.87	30.449	20.99	37.47	51.06	40.313	68.07
30.7	11.616	42.95	30.840	19.92	37.98	52.94	40.636	66.47
June 9.7	11.950	45.42	31.220	19.14	38.46	55.31	40.951	64.95
19.6	12.260	48.19	31.579	18.66	38.90	58.09	41.249	63.55
29.6	12.537	51.20	31.910	18.51	39.28	61.23	41.524	62.33
July 9.6	12.772	54.37	32.203	18.67	39.59	64.63	41.767	61.28
19.6	12.962	57.62	32.451	19.13	39.82	68.22	41.974	60.44
29.5	13.101	60.89	32.648	19.88	39.97	71.92	42.139	59.83
Aug. 8.5	13.188	64.09	32.787	20.87	40.05	75.63	42.259	59.43
18.5	13.222	67.16	32.868	22.07	40.05	79.29	42.332	59.25
28.5	13.204	70.05	32.892	23.40	39.96	82.80	42.358	59.27
Sept. 7.4	13.138	72.68	32.857	24.83	39.80	86.12	42.339	59.46
17.4	13.028	75.02	32.772	26.28	39.57	89.15	42.280	59.79
27.4	12.880	77.03	32.641	27.67	39.28	91.84	42.187	60.22
Oct. 7.3	12.702	78.65	32.473	28.94	38.95	94.14	42.065	60.72
17.3	12.502	79.87	32.281	30.02	38.57	96.00	41.925	61.25
27.3	12.288	80.65	32.074	30.89	38.16	97.35	41.774	61.78
Nov. 6.3	12.071	80.98	31.864	31.47	37.75	98.18	41.622	62.29
16.2	11.859	80.84	31.660	31.74	37.33	98.44	41.476	62.75
26.2	11.657	80.23	31.475	31.71	36.92	98.12	41.345	63.14
Dec. 6.2	11.475	79.17	31.317	31.35	36.53	97.24	41.236	63.45
16.2	11.319	77.68	31.193	30.68	36.18	95.79	41.151	63.66
26.1	11.194	75.82	31.107	29.73	35.88	93.83	41.095	63.79
36.1	11.104	73.61	31.064	28.52	35.63	91.44	41.070	63.82
Mean Place	9.301	47.12	27.288	40.04	36.023	60.93	37.651	79.32
Sec δ , Tan δ	1.288	+0.811	1.328	-0.874	2.147	+1.900	1.047	-0.309
$D\phi\alpha$, $D\omega\alpha$	+0.05	-0.04	+0.08	+0.04	+0.03	-0.10	+0.07	+0.02
$D\phi\delta$, $D\omega\delta$	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7	+0.3	-0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	1 Pegasi. Mag. 4.2		γ Pavonis. Mag. 4.3		ζ Capricorni. Mag. 3.9		δ Cygni. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 18 s	° ' " +19 26 "	h m 21 19 s	° ' " -65 44 "	h m 21 21 s	° ' " -22 45 "	h m 21 26 s	° ' " +46 10 "
Jan. 1.1	14.619	61.83	35.29	43.53	55.965	80.58	22.255	39.31
11.1	14.593	60.13 ²⁶ ₆	35.18 ¹¹ ₃	40.96 ²⁵⁷ ₈	55.958	80.23 ³⁵ ₂₇	22.154 ¹⁰¹ ₅₈	36.92 ²³⁹ ₂₆₃
21.1	14.599	58.34 ¹⁷⁹ ₄₀	35.15 ⁶ ₆	38.13 ²⁸³ ₃₀₃	55.985	79.73 ⁵⁰ ₆₅	22.096 ¹⁰ ₄₁	34.29 ²⁷⁸ ₂₈₁
31.0	14.639	56.53 ¹⁸¹ ₇₃	35.21 ¹⁵ ₂₃	35.10 ³¹³ ₃₁₇	56.045	79.08 ⁷⁹ ₉₄	22.086 ⁹¹ ₉₁	31.51 ²⁷¹ ₂₇₁
Feb. 10.0	14.712	54.80 ¹⁵⁷ ₁₀₈	35.36 ¹⁵ ₂₃	31.97 ³¹³ ₃₁₇	56.136	78.29 ⁷⁹ ₉₄	22.127 ⁹¹ ₉₁	28.70 ²⁷¹ ₂₇₁
20.0	14.820	53.23 ¹³⁵ ₁₄₁	35.59 ³⁰ ₃₀	28.80 ³¹⁵ ₃₁₅	56.261	77.35 ¹⁰⁸ ₁₀₈	22.218 ¹⁴⁴ ₁₄₄	25.99 ²⁵⁰ ₂₅₀
Mar. 1.9	14.961	51.88 ¹⁰⁴ ₁₇₅	35.89 ³⁷ ₃₇	25.65 ³⁰⁶ ₃₀₆	56.418	76.27 ¹²⁴ ₁₂₄	22.362 ¹⁹⁶ ₁₉₆	23.49 ²²⁰ ₂₂₀
11.9	15.136	50.84 ⁶⁸ ₂₀₇	36.26 ⁴³ ₄₃	22.60 ²⁹² ₂₉₂	56.605	75.03 ¹³⁶ ₁₃₆	22.558 ²⁴² ₂₄₂	21.29 ¹⁸⁹ ₁₈₉
21.9	15.343	50.16 ²⁸ ₂₃₆	36.69 ⁵⁰ ₅₀	19.68 ²⁶⁹ ₂₆₉	56.823	73.67 ¹⁴⁸ ₁₄₈	22.800 ²⁸⁷ ₂₈₇	19.49 ¹³² ₁₃₂
31.9	15.579	49.88 ¹⁵ ₂₆₄	37.19 ⁵⁴ ₅₄	16.99 ²⁴⁴ ₂₄₄	57.070	72.19 ¹⁶⁸ ₁₆₈	23.087 ³²³ ₃₂₃	18.17 ⁷⁹ ₇₉
Apr. 10.8	15.843	50.03 ⁵⁸ ₂₈₆	37.73 ⁵⁹ ₅₉	14.55 ²¹³ ₂₁₃	57.341	70.61 ¹⁶⁶ ₁₆₆	23.410 ³⁵⁵ ₃₅₅	17.38 ²³ ₂₃
20.8	16.129	50.61 ¹⁰⁰ ₃₀₄	38.32 ⁶³ ₆₃	12.42 ¹⁷⁷ ₁₇₇	57.637	68.95 ¹⁶⁸ ₁₆₈	23.765 ³⁷⁷ ₃₇₇	17.15 ³⁶ ₃₆
30.8	16.433	51.61 ¹³⁸ ₃₁₄	38.95 ⁶⁴ ₆₄	10.65 ¹⁴⁰ ₁₄₀	57.951	67.27 ¹⁶⁷ ₁₆₇	24.142 ³⁹⁰ ₃₉₀	17.51 ⁹² ₉₂
May 10.8	16.747	52.99 ¹⁷⁵ ₃₁₉	39.59 ⁶⁵ ₆₅	9.25 ⁹⁷ ₉₇	58.277	65.60 ¹⁶¹ ₁₆₁	24.532 ³⁹⁴ ₃₉₄	18.43 ¹⁴⁵ ₁₄₅
20.7	17.066	54.74 ²⁰⁵ ₃₁₅	40.24 ⁶⁵ ₆₅	8.28 ⁵⁴ ₅₄	58.611	63.99 ¹⁵² ₁₅₂	24.926 ³⁸⁵ ₃₈₅	19.88 ¹⁹⁵ ₁₉₅
30.7	17.381	56.79 ²²⁸ ₃₀₃	40.89 ⁶² ₆₂	7.74 ⁸ ₈	58.945	62.47 ¹⁴⁰ ₁₄₀	25.311 ³⁶⁹ ₃₆₉	21.83 ²³ ₂₃
June 9.7	17.684	59.07 ²⁴⁶ ₂₈₅	41.51 ⁵⁸ ₅₈	7.66 ³⁶ ₃₆	59.271	61.07 ¹²¹ ₁₂₁	25.680 ³⁴¹ ₃₄₁	24.20 ²⁵⁷ ₂₅₇
19.6	17.969	61.53 ²⁵⁹ ₂₅₉	42.09 ⁵⁴ ₅₄	8.02 ⁷⁹ ₇₉	59.580	59.86 ¹⁰² ₁₀₂	26.021 ³⁰⁶ ₃₀₆	26.95 ²⁷⁵ ₂₇₅
29.6	18.228	64.12 ²⁶³ ₂₂₆	42.63 ⁴⁷ ₄₇	8.81 ¹²⁰ ₁₂₀	59.867	58.84 ⁷⁸ ₇₈	26.327 ²⁸² ₂₈₂	29.98 ³²⁵ ₃₂₅
July 9.6	18.454	66.75 ²⁶¹ ₁₈₈	43.10 ⁴⁰ ₄₀	10.01 ¹⁵⁷ ₁₅₇	60.121	58.06 ⁵⁶ ₅₆	26.589 ²¹³ ₂₁₃	33.23 ³³⁹ ₃₃₉
19.6	18.642	69.36 ²⁵³ ₁₄₆	43.50 ³¹ ₃₁	11.58 ¹⁸⁸ ₁₈₈	60.338	57.50 ³⁰ ₃₀	26.802 ¹⁵⁹ ₁₅₉	36.62 ³⁴⁴ ₃₄₄
29.5	18.788	71.89 ²⁴² ₁₀₁	43.81 ²¹ ₂₁	13.46 ²¹⁴ ₂₁₄	60.512	57.20 ⁸ ₈	26.961 ¹⁰¹ ₁₀₁	40.06 ³⁴³ ₃₄₃
Aug. 8.5	18.889	74.31 ²²⁵ ₅₅	44.02 ¹⁰ ₁₀	15.60 ²²⁹ ₂₂₉	60.640	57.12 ¹⁶ ₁₆	27.062 ⁴³ ₄₃	43.48 ³³⁴ ₃₃₄
18.5	18.944	76.56 ²⁰³ ₁₀	44.12 ¹ ₁	17.89 ²³⁹ ₂₃₉	60.719	57.28 ³³ ₃₃	27.105 ¹⁴ ₁₄	46.82 ³¹⁷ ₃₁₇
28.5	18.954	78.59 ¹⁸⁰ ₃₃	44.13 ⁹ ₉	20.28 ²³⁸ ₂₃₈	60.750	57.61 ⁴⁹ ₄₉	27.091 ⁶⁸ ₆₈	49.99 ²⁸⁶ ₂₈₆
Sept. 7.4	18.921	80.39 ¹⁵³ ₇₁	44.04 ¹⁹ ₁₉	22.66 ²²⁸ ₂₂₈	60.734	58.10 ⁶² ₆₂	27.023 ¹¹⁷ ₁₁₇	52.94 ²⁶⁷ ₂₆₇
17.4	18.850	81.92 ¹²⁴ ₁₀₃	43.85 ²⁷ ₂₇	24.94 ²⁰⁷ ₂₀₇	60.676	58.72 ⁶⁸ ₆₈	26.906 ¹⁵⁹ ₁₅₉	55.61 ²³⁵ ₂₃₅
27.4	18.747	83.16 ⁹⁵ ₁₃₀	43.58 ³⁵ ₃₅	27.01 ¹⁷⁸ ₁₇₈	60.581	59.40 ⁷³ ₇₃	26.747 ¹⁹⁵ ₁₉₅	57.96 ¹⁹⁵ ₁₉₅
Oct. 7.3	18.617	84.11 ⁶³ ₁₄₈	43.23 ⁴⁰ ₄₀	28.79 ¹⁴³ ₁₄₃	60.456	60.13 ⁶⁵ ₆₅	26.552 ²²² ₂₂₂	59.91 ¹⁵⁵ ₁₅₅
17.3	18.469	84.74 ³¹ ₁₅₈	42.83 ⁴³ ₄₃	30.22 ⁹⁸ ₉₈	60.312	60.83 ⁶⁵ ₆₅	26.330 ²⁴⁰ ₂₄₀	61.46 ¹⁰⁹ ₁₀₉
27.3	18.311	85.05 ⁰ ₁₆₁	42.40 ⁴⁵ ₄₅	31.20 ⁴⁹ ₄₉	60.156	61.48 ⁵⁷ ₅₇	26.090 ²⁴⁸ ₂₄₈	62.55 ⁶⁰ ₆₀
Nov. 6.3	18.150	85.05 ³⁴ ₁₅₅	41.95 ⁴⁴ ₄₄	31.69 ³ ₃	59.997	62.05 ⁴⁶ ₄₆	25.842 ²⁴⁸ ₂₄₈	63.15 ¹¹ ₁₁
16.2	17.995	84.71 ⁶⁴ ₁₄₄	41.51 ⁴¹ ₄₁	31.66 ⁵⁵ ₅₅	59.844	62.51 ³³ ₃₃	25.594 ²⁴⁰ ₂₄₀	63.26 ⁴¹ ₄₁
26.2	17.851	84.07 ⁹³ ₁₂₅	41.10 ³⁷ ₃₇	31.11 ¹⁰⁸ ₁₀₈	59.705	62.84 ¹⁸ ₁₈	25.354 ²²¹ ₂₂₁	62.85 ⁹¹ ₉₁
Dec. 6.2	17.726	83.14 ¹²² ₁₀₄	40.73 ³¹ ₃₁	30.05 ¹⁵⁴ ₁₅₄	59.588	63.02 ⁴ ₄	25.133 ¹⁹⁸ ₁₉₈	61.94 ¹³⁹ ₁₃₉
16.2	17.622	81.92 ¹⁴⁴ ₇₆	40.42 ²⁴ ₂₄	28.51 ¹⁹⁸ ₁₉₈	59.496	63.06 ¹⁰ ₁₀	24.935 ¹⁶⁶ ₁₆₆	60.55 ¹⁸² ₁₈₂
26.1	17.546	80.48 ¹⁶⁴ ₄₈	40.18 ¹⁷ ₁₇	26.53 ²³⁵ ₂₃₅	59.434	62.96 ²⁶ ₂₆	24.769 ¹²⁹ ₁₂₉	58.73 ²²² ₂₂₂
36.1	17.498	78.84 ¹⁶⁴ ₄₈	40.01 ¹⁷ ₁₇	24.18 ²³⁵ ₂₃₅	59.404	62.70 ²⁶ ₂₆	24.640 ¹²⁹ ₁₂₉	56.51 ²²² ₂₂₂
Mean Place	14.864	55.70	35.870	34.26	55.893	77.40	23.141	27.13
Sec δ, Tan δ	1.061	+0.353	2.434	-2.219	1.084	-0.420	1.444	+1.042
Dψ α, Dω α	+0.05	-0.02	+0.10	+0.11	+0.07	+0.02	+0.04	-0.05
Dψ δ, Dω δ	+0.3	-0.6	+0.3	-0.6	+0.3	-0.6	+0.3	-0.6

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Aquarii. Mag. 3.1			β Cephei. Mag. 3.3			ξ Aquarii. Mag. 4.8			74 Cygni. Mag. 5.1		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 21 27	s — 5 55	° ' "	h m 21 27	s +70 11	° ' "	h m 21 33	s — 8 13	° ' "	h m 21 33	s +40 2	° ' "
Jan. 1.1	11.484	12	72.54	32.60	35	62.04	20.166	16	37.15	36.673	85	36.04
11.1	11.472	18	73.08	32.25	24	59.53	20.150	15	37.56	36.588	85	33.81
21.1	11.490	47	73.56	32.01	15	56.68	20.165	42	37.90	36.541	5	31.36
31.0	11.537	78	73.94	31.86	4	53.58	20.207	74	38.12	36.536	38	28.77
Feb. 10.0	11.615	109	74.18	31.82	9	50.36	20.281	104	38.22	36.574	84	26.19
20.0	11.724	138	74.28	31.91	21	47.15	20.385	133	38.16	36.658	131	23.68
Mar. 2.0	11.862	160	74.18	32.12	31	44.09	20.518	165	37.90	36.789	175	21.37
11.9	12.031	198	73.85	32.43	42	41.29	20.683	193	37.44	36.964	219	19.37
21.9	12.229	236	73.30	32.85	51	38.88	20.876	223	36.75	37.183	260	17.76
31.9	12.454	262	72.49	33.36	59	36.94	21.099	249	35.84	37.443	296	16.60
Apr. 10.8	12.706	274	71.45	33.95	65	35.54	21.348	272	34.70	37.739	326	15.94
20.8	12.980	292	70.18	34.60	70	34.74	21.620	291	33.36	38.064	348	15.83
30.8	13.272	307	68.72	35.30	70	34.57	21.911	307	31.85	38.412	362	16.26
May 10.8	13.579	312	67.08	36.00	69	35.02	22.218	314	30.19	38.774	367	17.24
20.7	13.891	313	65.34	36.69	68	36.07	22.532	315	28.44	39.141	364	18.71
30.7	14.204	305	63.53	37.37	63	37.71	22.847	308	26.63	39.505	349	20.64
June 9.7	14.509	291	61.69	38.00	57	39.86	23.155	296	24.83	39.854	328	22.97
19.7	14.800	268	59.88	38.57	49	42.47	23.451	274	23.08	40.182	296	25.64
29.6	15.068	240	58.15	39.06	41	45.48	23.725	245	21.43	40.478	267	28.57
July 9.6	15.308	204	56.55	39.47	32	48.79	23.970	211	19.90	40.735	214	31.70
19.6	15.512	165	55.09	39.79	20	52.34	24.181	172	18.54	40.949	164	34.94
29.5	15.677	121	53.81	39.99	10	56.04	24.353	129	17.38	41.113	112	38.22
Aug. 8.5	15.798	77	52.75	40.09	1	59.80	24.482	83	16.42	41.225	59	41.47
18.5	15.875	32	51.88	40.08	11	63.56	24.565	39	15.69	41.284	6	44.61
28.5	15.907	11	51.24	39.97	22	67.22	24.604	4	15.16	41.290	44	47.60
Sept. 7.4	15.896	49	50.79	39.75	31	70.72	24.600	42	14.85	41.246	89	50.37
17.4	15.847	83	50.54	39.44	39	73.98	24.558	78	14.72	41.157	130	52.86
27.4	15.764	111	50.46	39.05	46	76.93	24.480	105	14.75	41.027	163	55.03
Oct. 7.4	15.653	128	50.54	38.59	53	79.51	24.375	127	14.93	40.864	187	56.84
17.3	15.525	140	50.75	38.06	56	81.65	24.248	138	15.22	40.677	204	58.27
27.3	15.385	142	51.06	37.50	59	83.32	24.110	141	15.60	40.473	212	59.26
Nov. 6.3	15.243	138	51.46	36.91	61	84.45	23.969	138	16.05	40.261	213	59.80
16.2	15.105	126	51.93	36.30	60	85.02	23.831	127	16.54	40.048	205	59.87
26.2	14.979	108	52.46	35.70	58	84.99	23.704	110	17.05	39.843	190	59.47
Dec. 6.2	14.871	86	53.02	35.12	53	84.37	23.594	89	17.58	39.653	168	58.61
16.2	14.785	60	53.60	34.59	48	83.17	23.505	63	18.10	39.485	143	57.30
26.1	14.725	32	54.19	34.11	41	81.41	23.442	37	18.60	39.342	109	55.58
36.1	14.693		54.76	33.70		79.16	23.405		19.07	39.233		53.51
Mean Place	11.442		73.11	35.732		46.22	20.090		37.29	37.291		24.51
Sec δ , Tan δ	1.005		-0.104	2.952		+2.778	1.010		-0.145	1.306		+0.840
$D_{\psi} \alpha$, $D_{\omega} \alpha$	+0.06		+0.01	+0.02		-0.15	+0.06		+0.01	+0.05		-0.04
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Capricorni. Mag. 3.8			ϵ Pegasi. Mag. 2.5			11 Cephei. Mag. 4.8			δ Capricorni. Mag. 3.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	21 35		-17 1	21 40		+ 9 29	21 40		+70 55	21 42		-16 29
Jan. 1.1	29.794	18	77.78	6.527	30	42.70	39.54	40	61.52	27.841	23	77.97
11.1	29.776	13	77.74	6.497	4	41.47	39.14	28	59.17	27.818	6	77.97
21.1	29.789	44	77.56	6.493	27	40.22	38.86	19	56.43	27.824	37	77.85
31.0	29.833	75	77.26	6.520	58	38.99	38.67	8	53.41	27.861	68	77.57
Feb. 10.0	29.908	107	76.81	6.578	87	37.85	38.59	5	50.24	27.929	97	77.15
20.0	30.015	137	76.19	6.665	121	36.85	38.64	18	47.04	28.026	130	76.56
Mar. 2.0	30.152	168	75.40	6.786	153	36.06	38.82	29	43.95	28.156	161	75.79
11.9	30.320	199	74.44	6.939	184	35.52	39.11	40	41.09	28.317	191	74.85
21.9	30.519	227	73.29	7.123	215	35.30	39.51	50	38.58	28.508	222	73.72
31.9	30.746	256	71.99	7.338	242	35.41	40.01	59	36.51	28.730	250	72.42
Apr. 10.9	31.002	278	70.55	7.580	269	35.87	40.60	66	34.96	28.980	275	70.97
20.8	31.280	301	68.97	7.849	288	36.68	41.25	71	34.00	29.255	296	69.38
30.8	31.581	314	67.28	8.137	304	37.83	41.96	73	33.64	29.551	313	67.69
May 10.8	31.895	322	65.57	8.441	311	39.29	42.69	72	33.89	29.864	325	65.94
20.7	32.217	326	63.83	8.752	313	41.02	43.41	70	34.78	30.187	325	64.18
30.7	32.543	319	62.13	9.065	306	42.97	44.11	67	36.24	30.512	321	62.45
June 9.7	32.862	306	60.53	9.371	292	45.09	44.78	62	38.24	30.833	308	60.81
19.7	33.168	285	59.04	9.663	271	47.31	45.40	54	40.72	31.141	289	59.27
29.6	33.453	257	57.72	9.934	242	49.58	45.94	46	43.62	31.430	260	57.90
July 9.6	33.710	221	56.59	10.176	208	51.84	46.40	36	46.82	31.690	226	56.72
19.6	33.931	181	55.68	10.384	169	54.05	46.78	24	50.31	31.916	187	55.77
29.6	34.112	137	55.00	10.553	126	56.14	47.00	14	53.98	32.103	143	55.06
Aug. 8.5	34.249	90	54.55	10.679	82	58.09	47.14	4	57.74	32.246	97	54.56
18.5	34.339	44	54.34	10.761	38	59.85	47.18	8	61.52	32.343	50	54.32
28.5	34.383	1	54.34	10.799	3	61.41	47.10	18	65.24	32.393	5	54.28
Sept. 7.4	34.382	43	54.53	10.796	43	62.74	46.92	29	66.81	32.398	36	54.45
17.4	34.339	79	54.87	10.753	77	63.82	46.63	37	72.19	32.362	73	54.78
27.4	34.260	110	55.33	10.676	103	64.67	46.26	45	75.27	32.289	104	55.23
Oct. 7.4	34.150	130	55.87	10.573	125	65.27	45.81	51	77.99	32.185	126	55.78
17.3	34.020	143	56.46	10.448	137	65.63	45.30	57	80.31	32.059	139	56.38
27.3	33.877	148	57.06	10.311	142	65.74	44.73	60	82.16	31.920	145	56.99
Nov. 6.3	33.729	144	57.63	10.169	140	65.63	44.13	62	83.50	31.775	142	57.59
16.3	33.585	134	58.15	10.029	131	65.28	43.51	62	84.28	31.633	133	58.14
26.2	33.451	115	58.61	9.898	117	64.73	42.89	60	84.46	31.500	117	58.63
Dec. 6.2	33.336	93	58.98	9.781	99	63.98	42.29	57	84.04	31.383	96	59.04
16.2	33.243	67	59.23	9.682	75	63.06	41.72	51	83.02	31.287	71	59.35
26.1	33.176	38	59.39	9.607	51	61.98	41.21	45	81.45	31.216	45	59.55
36.1	33.138		59.45	9.556		60.79	40.76		79.36	31.171		59.64
Mean Place	29.676		75.90	6.553		37.98	42.615		44.50	27.698		76.26
Sec δ , Tan δ	1.046		-0.306	1.014		+0.167	3.061		+2.893	1.043		-0.296
$D\psi\alpha$, $D_\alpha\alpha$	+0.07		+0.02	+0.06		-0.01	+0.02		-0.16	+0.06		+0.02
$D\psi\delta$, $D_\alpha\delta$	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6	+0.3		-0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^3 Cygni. Mag. 4.3		μ Capricorni. Mag. 5.2		γ Grinis. Mag. 3.2		16 Pegasi. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 43	° ' " +48 55	h m 21 48	° ' " -13 56	h m 21 48	° ' " -37 44	h m 21 49	° ' " +25 31
Jan. 1.1	42.658 133	44.43 229	46.502 27	36.44 12	54.568 48	87.48 107	16.890 60	72.39 176
11.1	42.525 89	42.14 258	46.475 0	36.56 1	54.520 10	86.41 132	16.830 30	70.63 190
21.1	42.436 40	39.56 276	46.475 81	36.57 12	54.510 27	85.09 154	16.800 1	68.73 197
31.0	42.396 12	36.80 284	46.506 60	36.45 29	54.537 66	83.55 173	16.801 37	66.76 196
Feb. 10.0	42.408 66	33.96 280	46.566 90	36.16 45	54.603 104	81.82 189	16.838 72	64.80 185
20.0	42.474 123	31.16 263	46.656 123	35.71 64	54.707 141	79.93 202	16.910 110	62.95 166
Mar. 2.0	42.597 178	28.53 237	46.778 153	35.07 82	54.848 179	77.91 212	17.020 147	61.29 140
11.9	42.775 231	26.16 199	46.931 183	34.25 101	55.027 217	75.79 218	17.167 183	59.89 104
21.9	43.006 280	24.17 153	47.114 215	33.24 122	55.244 262	73.61 221	17.350 219	58.85 64
31.9	43.286 324	22.64 102	47.329 242	32.02 139	55.496 285	71.40 219	17.569 252	58.21 22
Apr. 10.9	43.610 361	21.62 45	47.571 269	30.63 154	55.781 315	69.21 212	17.821 280	57.99 26
20.8	43.971 387	21.17 13	47.840 290	29.09 168	56.096 340	67.09 204	18.101 304	58.24 71
30.8	44.358 406	21.29 69	48.130 308	27.41 175	56.436 361	65.05 189	18.405 319	58.95 114
May 10.8	44.764 412	21.98 124	48.438 319	25.66 180	56.797 373	63.16 199	18.724 329	60.09 155
20.7	45.176 409	23.22 176	48.757 322	23.86 179	57.170 378	61.47 147	19.053 331	61.64 190
30.7	45.585 393	24.98 222	49.079 318	22.07 174	57.548 374	60.00 119	19.384 324	63.54 223
June 9.7	45.978 369	27.20 262	49.397 307	20.33 164	57.922 362	58.81 90	19.708 307	65.77 246
19.7	46.347 333	29.82 295	49.704 289	18.69 151	58.284 339	57.91 57	20.015 285	68.23 265
29.6	46.680 291	32.77 319	49.993 261	17.18 132	58.623 306	57.34 24	20.300 255	70.88 276
July 9.6	46.971 241	35.96 337	50.254 229	15.86 111	58.931 269	57.10 9	20.555 218	73.64 280
19.6	47.212 184	39.33 346	50.483 190	14.75 90	59.200 228	57.19 41	20.773 176	76.44 279
29.6	47.396 127	42.79 349	50.673 147	13.85 66	59.423 172	57.60 70	20.949 132	79.23 272
Aug. 8.5	47.523 98	46.28 344	50.820 102	13.19 42	59.595 118	58.30 95	21.081 85	81.95 267
18.5	47.591 8	49.72 331	50.922 56	12.77 19	59.713 62	59.25 118	21.166 39	84.52 242
28.5	47.599 50	53.03 311	50.978 12	12.58 0	59.775 6	60.43 131	21.205 6	86.94 218
Sept. 7.4	47.549 102	56.14 287	50.990 30	12.58 19	59.781 45	61.74 141	21.199 46	89.12 193
17.4	47.447 148	59.01 266	50.960 68	12.77 33	59.736 90	63.15 143	21.153 83	91.05 165
27.4	47.299 187	61.57 219	50.892 96	13.10 44	59.646 130	64.58 138	21.070 114	92.70 134
Oct. 7.4	47.112 220	63.76 179	50.796 120	13.54 52	59.516 161	65.96 127	20.956 136	94.04 100
17.3	46.892 241	65.55 134	50.676 134	14.06 57	59.355 179	67.23 108	20.820 151	95.04 66
27.3	46.651 255	66.89 86	50.542 140	14.63 57	59.176 190	68.31 87	20.669 160	95.70 81
Nov. 6.3	46.396 261	67.75 35	50.402 130	15.20 55	58.986 189	69.18 60	20.509 161	96.01 5
16.3	46.135 255	68.10 17	50.262 141	15.75 52	58.797 179	69.78 30	20.348 156	95.96 42
26.2	45.880 243	67.93 69	50.131 116	16.27 46	58.618 161	70.08 0	20.192 143	95.54 77
Dec. 6.2	45.637 222	67.24 120	50.015 97	16.73 39	58.457 137	70.08 31	20.049 127	94.77 109
16.2	45.415 194	66.04 166	49.918 73	17.12 30	58.320 107	69.77 62	19.922 105	93.68 139
26.1	45.221 159	64.38 209	49.845 49	17.42 20	58.213 73	69.15 90	19.817 79	92.29 165
36.1	45.062	62.29	49.796	17.62	58.140	68.25	19.738	90.64
Mean Place	43.539	30.44	46.341	35.42	54.415	81.18	17.082	63.21
Sec δ , Tan δ	1.522	+1.147	1.030	-0.248	1.265	-0.774	1.108	+0.478
D δ a, D α a	+0.04	-0.06	+0.06	+0.01	+0.07	+0.04	+0.05	-0.03
D δ δ , D α δ	+0.3	-0.6	+0.3	-0.5	+0.3	-0.5	+0.3	-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	79 Draconis. Mag. 6.6			ε Indi. Mag. 4.7			30 Pegasi. Mag. 5.7			α Aquarii. Mag. 3.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	21 51		+73 18	21 57		-57 7	21 57		+12 43	22 1		- 0 42
Jan. 1.1	45.79	48	52.22	1.080	109	49.13	2.737	47	24.72	31.448	39	81.96
11.1	45.31	38	50.00	0.971	53	47.25	2.690	19	23.44	31.409	14	82.69
21.1	44.93	27	47.35	0.918	6	45.03	2.671	8	22.09	31.395	13	83.38
31.1	44.66	12	44.40	0.924	64	42.55	2.679	39	20.74	31.408	41	84.00
Feb. 10.0	44.54	1	41.25	0.988	122	39.87	2.718	71	19.46	31.449	71	84.52
20.0	44.55	15	38.03	1.110	179	37.05	2.789	108	18.31	31.520	102	84.88
Mar. 2.0	44.70	29	34.90	1.289	236	34.14	2.892	136	17.34	31.622	133	85.03
11.9	44.99	42	31.96	1.525	290	31.22	3.028	170	16.64	31.755	163	84.97
21.9	45.41	54	29.33	1.815	340	28.34	3.198	203	16.22	31.921	197	84.64
31.9	45.95	64	27.12	2.155	390	25.55	3.401	282	16.15	32.118	226	84.04
Apr. 10.9	46.59	72	25.42	2.545	432	22.93	3.633	261	16.45	32.344	255	83.17
20.8	47.31	77	24.28	2.977	465	20.50	3.894	283	17.12	32.599	277	82.03
30.8	48.08	81	23.72	3.442	494	18.34	4.177	302	18.14	32.876	296	80.64
May 10.8	48.89	82	23.79	3.936	512	16.48	4.479	313	19.49	33.172	309	79.03
20.8	49.71	81	24.49	4.448	520	14.97	4.792	316	21.16	33.481	314	77.25
30.7	50.52	76	25.77	4.968	516	13.86	5.108	312	23.07	33.795	312	75.34
June 9.7	51.28	70	27.59	5.484	499	13.16	5.420	300	25.20	34.107	301	73.36
19.7	51.98	63	29.91	5.983	470	12.88	5.720	282	27.46	34.408	284	71.34
29.6	52.61	53	32.67	6.453	431	13.04	6.002	254	29.80	34.692	259	69.36
July 9.6	53.14	43	35.80	6.884	377	13.62	6.256	222	32.17	34.951	227	67.46
19.6	53.57	31	39.22	7.261	317	14.62	6.478	183	34.51	35.178	192	65.68
29.6	53.88	18	42.83	7.578	247	15.99	6.661	143	36.77	35.370	150	64.07
Aug. 8.5	54.06	7	46.58	7.825	171	17.70	6.804	98	38.89	35.520	107	62.63
18.5	54.13	6	50.38	7.996	92	19.66	6.902	54	40.85	35.627	63	61.42
28.5	54.07	18	54.14	8.088	14	21.83	6.956	12	42.61	35.690	21	60.41
Sept. 7.5	53.89	29	57.79	8.102	62	24.10	6.968	29	44.15	35.711	19	59.64
17.4	53.60	40	61.25	8.040	130	26.39	6.939	64	45.44	35.692	54	59.08
27.4	53.20	48	64.49	7.910	191	28.61	6.875	91	46.48	35.638	85	58.73
Oct. 7.4	52.72	57	67.40	7.719	240	30.66	6.784	116	47.26	35.553	105	58.59
17.3	52.15	63	69.88	7.479	273	32.47	6.668	129	47.79	35.447	123	58.61
27.3	51.52	68	71.92	7.206	296	33.95	6.539	189	48.05	35.324	181	58.80
Nov. 6.3	50.84	70	73.44	6.910	301	35.03	6.400	140	48.06	35.193	131	59.12
16.3	50.14	71	74.42	6.609	293	35.67	6.260	133	47.81	35.062	126	59.56
26.2	49.43	70	74.81	6.316	269	35.84	6.127	122	47.33	34.936	115	60.10
Dec. 6.2	48.73	67	74.59	6.047	239	35.53	6.005	108	46.62	34.821	100	60.73
16.2	48.06	62	73.77	5.808	194	34.75	5.897	87	45.71	34.721	80	61.43
26.2	47.44	54	72.36	5.614	147	33.52	5.810	65	44.62	34.641	58	62.16
36.1	46.90		70.42	5.467		31.88	5.745		43.37	34.583		62.91
Mean Place	49.247		33.99	1.104		39.60	2.716		18.54	31.295		84.62
Sec δ, Tan δ	3.483		+3.336	1.842		-1.547	1.025		+0.226	1.000		-0.013
D _φ α, D _ω α	+0.01		-0.19	+0.08		+0.09	+0.06		-0.01	+0.06		0.00
D _φ δ, D _ω δ	+0.3		-0.5	+0.3		-0.5	+0.3		-0.5	+0.3		-0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Aquarii. Mag. 4.4			δ Cephei. Mag. 5.4			α Gruis. Mag. 2.2			ϵ Pegasi. Mag. 4.0		
	Right Ascension		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	22 1		-14 15	22 2		+62 22	22 3		-47 21	22 3		+24 56
Jan. 1.1	57.582	39	83.36	27.56	27	66.88	0.630	57.66	8.673	30.90		
11.1	57.543	12	83.48	27.29	21	64.71	0.544	56.19	8.605	29.24	168	
21.1	57.531	17	83.47	27.08	14	62.14	0.499	54.41	8.564	27.44	180	
31.1	57.548	45	83.32	26.94	6	59.29	0.498	52.36	8.554	25.56	188	
Feb. 10.0	57.593	76	83.00	26.88	2	56.26	0.542	50.11	8.578	23.67	180	
20.0	57.669	107	82.52	26.90	10	53.18	0.632	47.68	8.637	21.87	161	
Mar. 2.0	57.776	138	81.84	27.00	19	50.18	0.767	45.12	8.731	20.26	138	
11.9	57.914	171	80.98	27.19	26	47.38	0.947	42.50	8.864	18.88	104	
21.9	58.085	203	79.91	27.45	34	44.90	1.172	39.85	9.035	17.84	66	
31.9	58.288	232	78.84	27.79	41	42.84	1.438	37.23	9.242	17.18	25	
Apr. 10.9	58.520	260	77.20	28.20	47	41.27	1.744	34.69	9.483	16.93	19	
20.8	58.780	284	75.80	28.67	50	40.25	2.087	32.26	9.755	17.12	64	
30.8	59.064	304	73.88	29.17	53	39.83	2.461	30.01	10.052	17.76	108	
May 10.8	59.368	317	72.07	29.70	55	40.01	2.860	28.00	10.367	18.84	148	
20.8	59.685	323	70.22	30.25	54	40.79	3.276	26.25	10.695	20.32	184	
30.7	60.008	321	68.38	30.79	53	42.15	3.701	24.81	11.027	22.16	215	
June 9.7	60.329	311	66.59	31.32	49	44.05	4.124	23.73	11.355	24.31	240	
19.7	60.640	295	64.91	31.81	45	46.40	4.536	23.01	11.670	26.71	259	
29.6	60.935	270	63.36	32.26	40	49.18	4.925	22.69	11.963	29.30	271	
July 9.6	61.205	238	62.01	32.66	32	52.31	5.282	22.76	12.229	32.01	277	
19.6	61.443	200	60.87	32.98	25	55.69	5.597	23.21	12.461	34.78	275	
29.6	61.643	159	59.95	33.23	18	59.26	5.861	24.03	12.652	37.53	269	
Aug. 8.5	61.802	114	59.29	33.41	10	62.94	6.069	25.19	12.799	40.22	256	
18.5	61.916	68	58.86	33.51	2	66.66	6.215	26.61	12.901	42.78	241	
28.5	61.984	23	58.67	33.53	6	70.33	6.298	28.27	12.957	45.19	218	
Sept. 7.5	62.007	18	58.69	33.47	14	73.86	6.317	30.07	12.967	47.37	195	
17.4	61.989	56	58.91	33.33	20	77.21	6.275	31.95	12.937	49.32	167	
27.4	61.933	87	59.27	33.13	25	80.29	6.176	33.82	12.869	50.99	138	
Oct. 7.4	61.846	112	59.76	32.88	31	83.04	6.030	35.60	12.771	52.37	106	
17.3	61.734	128	60.33	32.57	35	85.41	5.846	37.20	12.646	53.43	70	
27.3	61.606	136	60.94	32.22	37	87.33	5.633	38.57	12.505	54.13	37	
Nov. 6.3	61.470	138	61.56	31.85	39	88.74	5.405	39.63	12.354	54.50	3	
16.3	61.332	122	62.16	31.46	40	89.62	5.172	40.33	12.199	54.53	33	
26.2	61.200	119	62.72	31.06	40	89.94	4.945	40.64	12.048	54.20	67	
Dec. 6.2	61.081	103	63.21	30.66	37	89.67	4.736	40.56	11.905	53.53	99	
16.2	60.978	82	63.62	30.29	34	88.83	4.551	40.08	11.777	52.54	129	
26.2	60.896	57	63.94	29.95	30	87.42	4.399	39.19	11.668	51.25	153	
36.1	60.839		64.14	29.65		85.52	4.283	37.94	11.581	49.72		
Mean Place	57.362		82.40	29.121		49.19	0.476	49.43	8.777	21.20		
Sec δ , Tan δ	1.032		-0.254	2.157		+1.912	1.476	-1.086	1.103	+0.465		
$D\psi\alpha$, $D\omega\alpha$	+0.06		+0.01	+0.04		-0.11	+0.08	+0.06	+0.05	-0.03		
$D\psi\delta$, $D\omega\delta$	+0.3		-0.5	+0.3		-0.5	+0.3	-0.5	+0.3	-0.5		

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pegasi. Mag. 3.7			π Pegasi. Mag. 4.4			ζ Cephei. Mag. 3.6			δ Cephei. Mag. 5.0		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 22 6	s + 5 47	° ' "	h m 22 6	s + 32 46	° ' "	h m 22 7	s + 57 47	° ' "	h m 22 8	s + 71 55	° ' "
Jan. 1.1	0.934	47	25.43	17.768	89	25.73	57.225	221	47.99	10.08	75.00	
11.1	0.887	21	24.44	17.679	59	23.91	57.004	172	45.87	9.61	72.95	205
21.1	0.866	—	23.44	17.620	26	21.85	56.832	114	43.38	9.23	70.45	250
31.1	0.871	5	22.47	17.594	11	19.67	56.718	50	40.61	8.95	67.61	284
Feb. 10.0	0.906	35	21.58	17.605	48	17.45	56.668	17	37.67	8.79	64.54	307
20.0	0.970	—	20.85	17.653	91	15.30	56.685	90	34.69	8.76	61.37	317
Mar. 2.0	1.065	95	20.29	17.744	132	11.53	56.775	161	31.78	8.86	58.22	315
12.0	1.194	129	19.99	17.876	174	10.09	56.936	232	29.08	9.08	55.24	298
21.9	1.356	162	19.95	18.050	215	9.06	57.168	297	26.69	9.44	52.54	270
31.9	1.549	193	20.22	18.265	262	8.47	57.465	357	24.71	9.90	50.22	232
Apr. 10.9	1.774	253	20.81	18.517	284	8.36	57.822	407	22.28	10.47	48.37	185
20.8	2.027	277	21.71	18.801	313	8.74	58.229	447	21.91	11.11	47.06	131
30.8	2.304	296	22.92	19.114	332	9.61	58.676	473	22.13	11.82	46.34	72
May 10.8	2.599	310	24.40	19.446	345	10.94	59.149	487	22.94	12.57	46.23	11
20.8	2.909	315	26.13	19.791	349	12.69	59.636	488	24.32	13.34	46.74	51
30.7	3.224	313	28.04	20.140	344	14.82	60.124	476	26.22	14.10	47.84	110
June 9.7	3.537	302	30.10	20.484	330	17.25	60.600	449	28.56	14.84	49.50	166
19.7	3.839	286	32.24	20.814	307	19.94	61.049	412	31.32	15.53	51.67	217
29.7	4.125	260	34.41	21.121	277	22.80	61.461	365	34.41	16.16	54.30	263
July 9.6	4.385	230	36.55	21.398	240	25.77	61.826	309	37.75	16.70	57.31	301
19.6	4.615	192	38.81	21.638	197	28.78	62.135	245	41.28	17.14	60.63	332
29.6	4.807	153	40.56	21.835	152	31.77	62.380	177	44.89	17.49	64.19	356
Aug. 8.5	4.960	109	42.35	21.987	103	34.68	62.557	109	48.53	17.73	67.90	371
18.5	5.069	66	43.94	22.090	54	37.45	62.666	37	52.12	17.86	71.69	379
28.5	5.135	23	45.33	22.144	8	40.01	62.703	31	55.57	17.85	75.48	379
Sept. 7.5	5.158	16	46.48	22.152	36	42.35	62.672	96	58.83	17.75	79.19	371
17.4	5.142	51	47.42	22.116	76	44.39	62.576	154	61.83	17.55	82.73	354
27.4	5.091	82	48.11	22.040	110	46.12	62.422	207	64.49	17.24	86.05	332
Oct. 7.4	5.009	108	48.58	21.930	136	47.52	62.215	250	66.78	16.84	89.06	301
17.4	4.906	121	48.83	21.794	156	48.53	61.965	285	68.63	16.36	91.71	285
27.3	4.785	130	48.88	21.638	169	49.16	61.680	311	69.99	15.82	93.92	221
Nov. 6.3	4.655	131	48.73	21.469	173	49.38	61.369	325	70.83	15.23	95.64	172
16.3	4.524	127	48.39	21.296	172	49.18	61.044	330	71.12	15.00	96.82	118
26.2	4.397	117	47.89	21.124	163	48.58	60.714	325	70.85	14.60	97.42	60
Dec. 6.2	4.280	108	47.22	20.961	151	47.58	60.389	309	70.02	13.96	97.41	1
16.2	4.177	85	46.44	20.810	131	46.22	60.080	285	68.65	13.33	96.80	61
26.2	4.092	63	45.54	20.679	108	44.54	59.795	249	66.79	12.71	95.60	120
36.1	4.029	—	44.56	20.571	—	—	59.546	—	—	11.61	93.84	176
Mean Place	0.805	20.84		17.996	13.86		58.365	30.65		12.885	55.62	
Sec δ , Tan δ	1.005	+0.101		1.189	+0.644		1.876	+1.588		3.225	+3.066	
$D\psi\alpha$, $D_\omega\alpha$	+0.06	-0.01		+0.05	-0.04		+0.04	-0.09		+0.02	-0.18	
$D\psi\delta$, $D_\omega\delta$	+0.3	-0.5		+0.3	-0.5		+0.4	-0.5		+0.4	-0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aquarii. Mag. 4.3		α Tucanæ. Mag. 2.9		γ Aquarii. Mag. 4.0		β Pegasi. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 12	° ' " - 8 11	h m 22 12	° ' " -60 39	h m 22 17	° ' " - 1 47	h m 22 17	° ' " +11 47
Jan. 1.1	27.539	48.32	49.49	95.38	22.420	78.50	26.094	18.17
11.1	27.493	48.72	49.32	93.38	22.369	79.17	26.035	16.99
21.1	27.472	49.03	49.20	91.03	22.343	79.79	26.000	15.76
31.1	27.477	49.21	49.15	88.37	22.341	80.33	25.990	14.52
Feb. 10.0	27.510	49.26	49.17	85.47	22.368	80.75	26.009	13.34
20.0	27.573	49.15	49.25	82.40	22.423	81.01	26.059	12.27
Mar. 2.0	27.666	48.84	49.39	79.24	22.509	81.09	26.142	11.37
12.0	27.792	48.31	49.59	76.04	22.628	80.94	26.258	10.72
21.9	27.960	47.54	49.85	72.88	22.779	80.55	26.409	10.35
31.9	28.139	46.56	50.18	69.82	22.962	79.88	26.594	10.30
Apr. 10.9	28.360	45.35	50.56	66.91	23.178	78.96	26.811	10.59
20.8	28.610	43.93	50.99	64.22	23.423	77.77	27.059	11.25
30.8	28.884	42.32	51.47	61.80	23.693	76.34	27.335	12.25
May 10.8	29.179	40.58	51.98	59.70	23.984	74.70	27.627	13.57
20.8	29.490	38.73	52.52	57.97	24.291	72.91	27.937	15.19
30.7	29.807	36.82	53.07	56.65	24.605	70.98	28.254	17.06
June 9.7	30.124	34.91	53.62	55.78	24.920	68.99	28.570	19.14
19.7	30.432	33.04	54.15	55.36	25.227	66.98	28.877	21.36
29.7	30.726	31.26	54.65	55.40	25.519	65.01	29.169	23.66
July 9.6	30.996	29.62	55.11	55.90	25.788	63.12	29.437	25.99
19.6	31.237	28.15	55.53	56.83	26.028	61.36	29.675	28.29
29.6	31.441	26.90	55.88	58.19	26.232	59.77	29.877	30.51
Aug. 8.5	31.605	25.86	56.16	59.90	26.397	58.37	30.037	32.60
18.5	31.726	25.06	56.35	61.90	26.520	57.19	30.156	34.54
28.5	31.802	24.48	56.46	64.10	26.599	56.23	30.232	36.27
Sept. 7.5	31.835	24.13	56.48	66.48	26.636	55.51	30.264	37.79
17.4	31.827	24.01	56.42	68.88	26.633	55.00	30.256	39.06
27.4	31.783	24.06	56.28	71.22	26.592	54.71	30.213	40.10
Oct. 7.4	31.707	24.28	56.07	73.41	26.521	54.61	30.138	40.88
17.4	31.607	24.63	55.81	75.34	26.426	54.68	30.040	41.42
27.3	31.488	25.07	55.50	76.94	26.312	54.91	29.922	41.70
Nov. 6.3	31.360	25.58	55.15	78.13	26.189	55.26	29.794	41.74
16.3	31.229	26.14	54.80	78.86	26.062	55.72	29.662	41.54
26.2	31.102	26.72	54.45	79.10	25.937	56.27	29.532	41.13
Dec. 6.2	30.986	27.30	54.11	78.83	25.822	56.89	29.408	40.49
16.2	30.883	27.85	53.81	78.04	25.718	57.55	29.298	39.66
26.2	30.798	28.37	53.55	76.76	25.631	58.24	29.204	38.68
36.1	30.735	28.83	53.33	75.04	25.565	58.93	29.128	37.54
Mean Place	27.295	49.13	49.495	85.05	22.185	81.22	25.960	11.51
Sec δ , Tan δ	1.010	-0.144	2.042	-1.780	1.000	-0.031	1.022	+0.209
$D\psi\alpha$, $D\omega\alpha$	+0.06	+0.01	+0.08	+0.11	+0.06	0.00	+0.06	-0.01
$D\psi\delta$, $D\omega\delta$	+0.4	-0.5	+0.4	-0.5	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Lacertæ. Mag. 4.6		π Aquarii. Mag. 4.6		σ Aquarii. Mag. 4.9		α Lacertæ. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 20 s	° ' " +51 48 s	h m 22 21 s	° ' " + 0 57 s	h m 22 26 s	° ' " -11 5 s	h m 22 27 s	° ' " +49 51 s
Jan. 1.2	16.946 ¹⁸⁴	63.41 ¹⁹⁸	2.526 ⁵⁴	24.30 ⁷⁷	15.710 ⁵⁶	70.69 ²⁶	51.662 ¹⁷⁵	36.53 ¹⁸⁸
11.1	16.762 ¹⁴⁴	61.43 ²³³	2.472 ³⁰	23.53 ⁸⁰	15.654 ³²	70.95 ¹⁶	51.487 ¹⁴¹	34.65 ²²⁵
21.1	16.618 ⁹⁹	59.10 ²⁶¹	2.442 ⁶	22.78 ⁶⁷	15.622 ⁸	71.11 ²	51.346 ⁹⁸	32.40 ²⁵²
31.1	16.519 ⁴⁶	56.49 ²⁷⁷	2.436 ²²	22.11 ⁵⁸	15.614 ²¹	71.13 ¹³	51.248 ⁵⁰	29.88 ²⁶⁸
Feb. 10.0	16.473 ¹⁰	53.72 ²⁸¹	2.458 ⁵⁰	21.53 ⁴³	15.635 ⁴⁸	71.00 ³³	51.198 ³	27.20 ²⁷³
20.0	16.483	50.91	2.508	21.10	15.683	70.67	51.201	24.47
Mar. 2.0	16.552 ⁶⁹	48.16 ²⁷⁵	2.591 ⁸³	20.87 ²³	15.763 ⁸⁰	70.16 ⁵¹	51.260 ⁵⁹	21.80 ²⁶⁷
12.0	16.683 ¹⁸¹	45.61 ²⁵⁵	2.705 ¹¹⁴	20.85 ²	15.875 ¹¹²	69.43 ⁷³	51.378 ¹¹⁸	19.30 ²⁵⁰
21.9	16.875 ¹⁹²	43.35 ²²⁶	2.852 ¹⁴⁷	21.10 ²⁵	16.020 ¹⁴⁵	68.50 ⁹⁸	51.555 ¹⁷⁷	17.09 ²²¹
31.9	17.125 ²⁵⁰	41.47 ¹⁸⁸	3.032 ¹⁸⁰	21.61 ⁵¹	16.198 ¹⁷⁸	67.34 ¹¹⁶	51.790 ²³⁵	15.25 ¹⁸⁴
Apr. 10.9	17.429 ³⁰⁴	40.07 ¹⁴⁰	3.244 ²¹²	22.41 ⁸⁰	16.409 ²¹¹	65.98 ¹³⁶	52.076 ²⁸⁶	13.86 ¹³⁹
20.9	17.779 ³⁵⁰	39.19 ⁸⁸	3.485 ²⁴¹	23.49 ¹⁰⁸	16.650 ²⁴¹	64.43 ¹⁵⁵	52.409 ³³³	12.98 ⁸⁸
30.8	18.168 ³⁸⁹	38.86 ³³	3.754 ²⁶⁹	24.83 ¹³⁴	16.919 ²⁶⁹	62.72 ¹⁷¹	52.779 ³⁷⁰	12.65 ³³
May 10.8	18.584 ⁴¹⁶	39.10 ²⁴	4.043 ²⁸⁹	26.41 ¹⁵⁸	17.210 ²⁹¹	60.89 ¹⁸³	53.180 ⁴⁰¹	12.87 ²²
20.8	19.018 ⁴³⁴	39.90 ⁸⁰	4.348 ³⁰⁵	28.17 ¹⁷⁶	17.518 ³⁰⁸	58.99 ¹⁹⁰	53.599 ⁴¹⁹	13.64 ⁷⁷
30.7	19.456 ⁴³⁸	41.24 ¹⁸⁴	4.661 ³¹³	30.09 ¹⁹²	17.836 ³¹⁸	57.05 ¹⁹⁴	54.025 ⁴²⁶	14.94 ¹³⁰
June 9.7	19.886 ⁴³⁰	43.08 ¹⁸⁴	4.976 ³¹⁵	32.10 ²⁰¹	18.156 ³²⁰	55.13 ¹⁹²	54.447 ⁴²²	16.74 ¹⁸⁰
19.7	20.300 ⁴¹⁴	45.36 ²²⁸	5.282 ³⁰⁶	34.15 ²⁰⁵	18.471 ³¹⁵	53.28 ¹⁸⁵	54.854 ⁴⁰⁷	18.98 ²²⁴
29.7	20.684 ³⁸⁴	48.03 ²⁶⁷	5.575 ²⁹³	36.20 ²⁰⁵	18.771 ³⁰⁰	51.54 ¹⁷⁴	55.234 ³⁸⁰	21.60 ²⁶²
July 9.6	21.030 ³⁴⁶	51.02 ²⁹⁹	5.844 ²⁶⁹	38.19 ¹⁹⁹	19.052 ²⁸¹	49.98 ¹⁵⁶	55.580 ³⁴⁶	24.53 ²⁹³
19.6	21.329 ²⁹⁹	54.25 ³²³	6.086 ²⁴²	40.08 ¹⁸⁹	19.303 ²⁶¹	48.60 ¹⁸⁸	55.882 ³⁰²	27.70 ³¹⁷
29.6	21.574 ²⁴⁵	57.64 ³³⁹	6.292 ²⁰⁶	41.82 ¹⁷⁴	19.520 ²¹⁷	47.45 ¹¹⁵	56.133 ²⁵¹	31.04 ³³⁴
Aug. 8.6	21.762 ¹⁸⁸	61.12 ³⁴⁸	6.459 ¹⁶⁷	43.36 ¹⁵⁴	19.698 ¹⁷⁸	46.53 ⁹²	56.329 ¹⁹⁶	34.47 ³⁴³
18.5	21.889 ¹²⁷	64.62 ³⁵⁰	6.584 ¹²⁶	44.71 ¹³⁵	19.833 ¹³⁵	45.87 ⁶⁶	56.467 ¹³⁸	37.92 ³⁴⁵
28.5	21.955 ⁶⁶	68.07 ³⁴⁵	6.666 ⁸²	45.83 ¹¹²	19.925 ⁹²	45.46 ⁴¹	56.546 ⁷⁹	41.32 ³⁴⁰
Sept. 7.5	21.960 ⁵	71.39 ³³²	6.706 ⁴⁰	46.73 ⁹⁰	19.972 ⁴⁷	45.29 ¹⁷	56.567 ²¹	44.61 ³²⁹
17.4	21.907 ⁵³	74.52 ³¹³	6.706 ⁰	47.39 ⁶⁶	19.977 ⁵	45.32 ³	56.533 ³⁴	47.70 ³⁰⁹
27.4	21.802 ¹⁰⁵	77.40 ²⁸⁸	6.669 ³⁷	47.84 ⁴⁵	19.945 ³²	45.55 ²³	56.447 ⁸⁶	50.55 ²⁸⁵
Oct. 7.4	21.651 ¹⁵¹	79.96 ²⁵⁶	6.800 ⁶⁹	48.07 ²³	19.879 ⁶⁶	45.92 ³⁷	56.316 ¹³¹	53.09 ²⁵⁴
17.4	21.462 ¹⁸⁹	82.15 ²¹⁹	6.508 ⁹²	48.12 ⁵	19.787 ⁹²	46.41 ⁴⁹	56.147 ¹⁶⁹	55.29 ²²⁰
27.3	21.239 ²²³	83.93 ¹⁷⁸	6.396 ¹¹²	48.00 ¹²	19.675 ¹¹²	46.99 ⁵⁸	55.946 ²⁰¹	57.08 ¹⁷⁹
Nov. 6.3	20.995 ²⁴⁴	85.25 ¹³²	6.274 ¹²³	47.71 ²⁹	19.551 ¹²⁴	47.61 ⁶²	55.722 ²²⁴	58.42 ¹³⁴
16.3	20.735 ²⁶⁰	86.08 ⁸⁸	6.148 ¹²⁶	47.30 ⁴¹	19.422 ¹²⁹	48.25 ⁶⁴	55.493 ²³⁹	59.28 ⁸⁶
26.3	20.470 ²⁶⁵	86.39 ³¹	6.023 ¹²⁵	46.78 ⁵²	19.294 ¹²⁸	48.87 ⁶²	55.237 ²⁴⁶	59.63 ³⁵
Dec. 6.2	20.207 ²⁶³	86.17 ²²	5.907 ¹¹⁶	46.15 ⁶³	19.175 ¹¹⁹	49.46 ⁵⁹	54.992 ²⁴⁵	59.47 ¹⁶
16.2	19.955 ²⁵²	85.41 ⁷⁶	5.802 ¹⁰⁵	45.44 ⁷¹	19.066 ¹⁰⁹	49.99 ⁵³	54.755 ²⁸⁷	58.79 ⁶⁸
26.2	19.721 ²⁸⁴	84.14 ¹²⁷	5.712 ⁹⁰	44.69 ⁷⁵	18.974 ⁹²	50.44 ⁴⁵	54.535 ²²⁰	57.60 ¹¹⁹
36.1	19.517 ³⁰⁴	82.41 ¹⁷³	5.643 ⁶⁹	43.91 ⁷⁸	18.902 ⁷²	50.80 ³⁶	54.338 ¹⁹⁷	55.95 ¹⁶⁵
Mean Place	17.636	46.37	2.291	20.70	15.390	70.87	52.200	19.43
Sec δ , Tan δ	1.618	+1.272	1.000	+0.017	1.019	-0.196	1.551	+1.186
$D_{\phi} \alpha$, $D_{\phi} \delta$	+0.05	-0.08	+0.06	0.00	+0.06	+0.01	+0.05	-0.07
$D_{\phi} \delta$, $D_{\phi} \delta$	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Aquarii. Mag. 5.3		226 B. Cephei. Mag. 5.7		♎ Aquarii. Mag. 4.1		10 Lacertae. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 30	° ' " -21 7	h m 22 30	° ' " +75 47	h m 22 31	° ' " - 0 32	h m 22 35	° ' " +38 36
	s "	s "	s "	s "	s "	s "	s "	s "
Jan. 1.2	9.663 62	64.66 15	45.96 67	76.42 174	5.799 60	40.91 70	31.956 126	79.34 171
11.1	9.601 39	64.51 34	45.29 57	74.68 224	5.739 38	41.61 66	31.830 101	77.63 201
21.1	9.562 11	64.17 58	44.72 45	72.44 264	5.701 13	42.27 59	31.729 67	75.62 220
31.1	9.551 17	63.64 75	44.27 29	69.80 293	5.688 13	42.86 48	31.662 31	73.42 232
Feb. 10.1	9.568 46	62.89 98	43.98 15	66.87 312	5.701 40	43.34 84	31.631 10	71.10 233
20.0	9.614 79	61.96 114	43.83 2	63.75 317	5.741 72	43.68 13	31.641 58	68.77 225
Mar. 2.0	9.693 113	60.82 132	43.85 19	60.58 307	5.813 104	43.81 8	31.696 101	66.52 206
12.0	9.806 147	59.50 151	44.04 34	57.51 288	5.917 187	43.73 33	31.797 148	64.46 179
21.9	9.953 182	57.99 168	44.38 50	54.63 255	6.054 173	43.40 60	31.945 198	62.67 142
31.9	10.185 216	56.31 180	44.88 64	52.08 213	6.226 204	42.80 87	32.141 240	61.25 99
Apr. 10.9	10.351 247	54.51 191	45.52 76	49.95 168	6.430 235	41.93 114	32.381 279	60.26 52
20.9	10.598 275	52.60 199	46.28 84	48.32 108	6.665 264	40.79 138	32.660 315	59.74 3
30.8	10.873 300	50.61 202	47.12 91	47.24 48	6.929 286	39.41 162	32.975 343	59.71 49
May 10.8	11.173 318	48.59 200	48.03 94	46.76 12	7.215 304	37.79 178	33.318 360	60.20 97
20.8	11.491 329	46.59 194	48.97 96	46.88 72	7.519 313	36.01 193	33.678 370	61.17 144
30.8	11.820 333	44.65 182	49.92 98	47.60 130	7.832 315	34.08 201	34.048 370	62.61 186
June 9.7	12.153 329	42.83 164	50.85 89	48.90 184	8.147 311	32.07 204	34.418 360	64.47 225
19.7	12.482 315	41.19 145	51.74 82	50.74 238	8.458 297	30.03 202	34.778 341	66.72 255
29.7	12.797 294	39.74 119	52.56 72	53.07 276	8.755 276	28.01 195	35.119 312	69.27 280
July 9.6	13.091 266	38.55 95	53.28 62	55.83 313	9.031 248	26.06 183	35.431 278	72.07 298
19.6	13.357 280	37.60 66	53.90 50	58.96 342	9.279 215	24.23 167	35.709 236	75.05 310
29.6	13.587 190	36.94 36	54.40 36	62.38 362	9.494 176	22.56 149	35.945 190	78.15 314
Aug. 8.6	13.777 146	36.58 9	54.76 23	66.00 375	9.670 135	21.07 127	36.135 141	81.29 311
18.5	13.923 100	36.49 18	54.99 9	69.75 382	9.805 93	19.80 104	36.276 91	84.40 301
28.5	14.023 53	36.67 42	55.08 5	73.57 380	9.898 50	18.76 81	36.367 40	87.41 288
Sept. 7.5	14.076 9	37.09 61	55.03 19	77.37 370	9.948 9	17.95 58	36.407 6	90.29 267
17.4	14.085 33	37.70 78	54.84 31	81.07 352	9.957 28	17.37 87	36.401 49	92.96 244
27.4	14.062 69	38.48 88	54.53 43	84.59 327	9.929 60	17.00 16	36.352 88	95.40 213
Oct. 7.4	13.983 96	39.36 93	54.10 54	87.86 294	9.899 104	16.84 2	36.264 121	97.53 180
17.4	13.887 120	40.29 94	53.56 64	90.80 255	9.785 104	16.86 19	36.143 146	99.33 144
27.3	13.767 132	41.23 89	52.92 71	93.35 209	9.681 118	17.05 33	35.997 166	100.77 104
Nov. 6.3	13.635 139	42.12 80	52.21 76	95.44 157	9.563 123	17.38 44	35.831 177	101.81 61
16.3	13.496 138	42.92 68	51.45 80	97.01 101	9.440 122	17.82 54	35.654 183	102.42 17
26.3	13.358 132	43.60 54	50.65 82	98.02 40	9.318 118	18.36 62	35.471 175	102.59 27
Dec. 6.2	13.226 118	44.14 37	49.83 82	98.42 22	9.202 107	18.98 68	35.289 175	102.32 72
16.2	13.108 102	44.51 17	49.01 78	98.20 82	9.095 92	19.66 72	35.114 162	101.60 114
26.2	13.006 80	44.68 0	48.23 71	97.38 142	9.003 75	20.38 73	34.952 144	100.46 151
36.1	12.926	44.68	47.52	95.96	8.928	21.11	34.808	98.95
Mean Place	9.299	62.09	49.232	55.01	5.504	44.30	32.103	64.45
Sec δ , Tan δ	1.072	-0.386	4.078	+3.953	1.000	-0.009	1.280	+0.799
D ϕ α , D α α	+0.06	+0.02	+0.02	-0.24	+0.06	0.00	+0.05	-0.05
D ϕ δ , D α δ	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4	+0.4	-0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Piscis Australis. Mag. 4.2			ζ Pegasi. Mag. 3.6			β Gruis. Mag. 2.2			γ Pegasi. Mag. 3.1		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	22 36		-27 28	22 37		+10 23	22 37		-47 18	22 39		+29 47
Jan. 1.2	4.445	74	41.72	19.577	69	58.55	43.390	137	77.70	6.608	102	24.74
11.1	4.371	50	41.32	19.508	50	57.49	43.263	91	76.45	6.506	78	23.19
21.1	4.321	22	40.66	19.458	25	56.37	43.172	52	74.84	6.428	52	21.44
31.1	4.299	8	39.78	19.433	1	55.25	43.120	10	72.91	6.376	20	19.53
Feb. 10.1	4.307	41	38.67	19.434	31	54.18	43.110	34	70.70	6.356	16	17.55
20.0	4.348	74	37.34	19.465	62	53.22	43.144	78	68.28	6.372	54	15.60
Mar. 2.0	4.422	109	35.82	19.527	96	52.43	43.222	124	65.66	6.426	94	13.75
12.0	4.531	144	34.11	19.623	132	51.85	43.346	171	62.92	6.520	137	12.11
21.9	4.675	181	32.25	19.755	167	51.55	43.517	217	60.11	6.657	179	10.73
31.9	4.856	217	30.26	19.922	202	51.54	43.734	262	57.27	6.836	219	9.72
Apr. 10.9	5.073	251	28.16	20.124	234	51.87	43.996	303	54.47	7.055	257	9.10
20.9	5.324	281	26.00	20.358	264	52.54	44.299	342	51.76	7.312	288	8.92
30.8	5.605	307	23.82	20.622	287	53.53	44.641	374	49.20	7.600	315	9.19
May 10.8	5.912	327	21.67	20.909	306	54.85	45.015	399	46.83	7.915	333	9.91
20.8	6.239	339	19.60	21.215	315	56.45	45.414	415	44.73	8.248	344	11.07
30.8	6.578	345	17.65	21.530	319	58.29	45.829	421	42.98	8.592	345	12.64
June 9.7	6.923	341	15.87	21.849	314	60.31	46.250	418	41.46	8.937	338	14.56
19.7	7.264	330	14.33	22.163	299	62.49	46.668	408	40.38	9.275	322	16.80
29.7	7.594	308	13.04	22.462	280	64.74	47.071	379	39.71	9.597	297	19.28
July 9.6	7.902	280	12.03	22.742	251	67.01	47.450	344	39.47	9.894	265	21.96
19.6	8.182	244	11.34	22.993	217	69.25	47.794	300	39.64	10.159	228	24.75
29.6	8.426	202	10.98	23.210	179	71.40	48.094	247	40.22	10.387	187	27.60
Aug. 8.6	8.628	157	10.93	23.389	139	73.44	48.341	189	41.17	10.574	142	30.44
18.5	8.785	108	11.19	23.528	96	75.31	48.530	129	42.48	10.716	95	33.21
28.5	8.893	60	11.71	23.624	58	76.98	48.659	66	44.08	10.811	49	35.86
Sept. 7.5	8.953	13	12.49	23.677	13	78.44	48.725	2	45.88	10.860	6	38.35
17.5	8.966	31	13.46	23.690	24	79.67	48.727	55	47.83	10.866	34	40.63
27.4	8.935	70	14.58	23.666	55	80.66	48.672	107	49.84	10.832	70	42.65
Oct. 7.4	8.865	101	15.77	23.611	82	81.40	48.565	151	51.83	10.762	98	44.39
17.4	8.764	126	16.97	23.529	102	81.91	48.414	186	53.70	10.664	123	45.83
27.3	8.638	141	18.13	23.427	117	82.17	48.229	211	55.36	10.541	139	46.92
Nov. 6.3	8.497	149	19.19	23.310	122	82.22	48.018	224	56.76	10.402	149	47.66
16.3	8.348	150	20.11	23.188	125	82.03	47.794	236	57.82	10.253	154	48.04
26.3	8.198	144	20.83	23.063	112	81.65	47.568	230	58.50	10.099	152	48.05
Dec. 6.2	8.054	132	21.34	22.941	84	81.08	47.348	203	58.76	9.947	145	47.67
16.2	7.922	114	21.60	22.829	59	80.32	47.145	180	58.60	9.802	134	46.93
26.2	7.808	93	21.63	22.729	34	79.43	46.965	151	58.02	9.668	117	45.84
36.2	7.715		21.39	22.645		78.41	46.814		57.03	9.551		44.44
Mean Place	4.046		37.50	19.326		51.67	43.040		68.97	6.566		12.05
Sec δ , Tan δ	1.127		-0.520	1.017		+0.184	1.475		-1.084	1.152		+0.572
$D\psi\alpha$, $D\omega\alpha$	+0.07		+0.03	+0.06		-0.01	+0.07		+0.07	+0.06		-0.04
$D\psi\delta$, $D\omega\delta$	+0.4		-0.4	+0.4		-0.4	+0.4		-0.4	+0.4		-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Pegasi. Mag. 4.1			ϵ Gruis. Mag. 3.7			τ Aquarii. Mag. 4.2			μ Pegasi. Mag. 3.7		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	22 42		+23 7	22 43		-51 44	22 45		-14 1	22 45		+24 9
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 1.2	32.088	90	53.67	33.185	155	82.36	12.378	68	51.86	59.914	94	58.15
11.1	31.948	68	52.29	33.090	116	80.98	12.310	48	52.04	59.820	72	56.77
21.1	31.880		50.75	32.914	74	79.21	12.262		52.07	59.748		55.22
31.1	31.836	44	49.09	32.840	27	77.09	12.238	24	51.94	59.700	48	53.54
Feb. 10.1	31.822	14	47.41	32.813	20	74.68	12.239	1	51.61	59.682	18	51.84
		18						30			15	
20.0	31.840		45.79	32.833		72.03	12.269		51.10	59.697		50.18
Mar. 2.0	31.893	58	44.28	32.903	70	69.21	12.329	60	50.38	59.745	48	48.63
12.0	31.983	90	42.99	33.023	120	66.27	12.420	91	49.46	59.833	88	47.27
21.9	32.113	130	41.96	33.194	171	63.26	12.548	128	48.32	59.960	127	46.19
31.9	32.282	169	41.27	33.416	222	60.25	12.709	161	46.99	60.127	167	45.44
		208			272			196			206	
Apr. 10.9	32.490		40.96	33.688		57.29	12.905		45.46	60.833		45.05
20.9	32.733	243	41.05	34.005	317	54.44	13.133	228	43.75	60.574	241	45.08
30.8	33.007	274	41.55	34.365	360	51.77	13.393	260	41.92	60.847	273	45.53
May 10.8	33.307	300	42.46	34.761	396	49.33	13.676	283	39.98	61.147	300	46.38
20.8	33.626	319	43.76	35.183	422	47.18	13.980	304	37.98	61.466	319	47.64
		330			442			318			332	
30.8	33.956		45.42	35.625		45.37	14.298		35.98	61.798		49.26
June 9.7	34.288	333	47.37	36.076	451	43.93	14.621	323	34.02	62.133	335	51.18
19.7	34.616	327	49.59	36.524	448	42.91	14.942	310	32.16	62.463	330	53.38
29.7	34.928	312	52.00	36.959	435	42.32	15.252	293	30.45	62.779	316	55.78
July 9.6	35.219	291	54.56	37.367	408	42.18	15.545	268	28.92	63.073	294	58.34
		261			373			265			265	
19.6	35.480		57.17	37.740		42.49	15.810		27.59	63.338		60.98
29.6	35.706	236	59.80	38.066	326	43.22	16.044	234	26.54	63.569	231	63.63
Aug. 8.6	35.893	187	62.38	38.337	271	44.36	16.239	196	25.74	63.760	191	66.24
18.5	36.037	144	64.87	38.547	210	45.84	16.394	155	25.20	63.907	147	68.77
28.5	36.137	109	67.22	38.690	143	47.63	16.504	110	24.94	64.010	103	71.17
		55			75			66			60	
Sept. 7.5	36.192		69.37	38.765		49.63	16.570		24.92	64.070		73.39
17.5	36.206	14	71.31	38.771	6	51.79	16.594	24	25.14	64.087	17	75.38
27.4	36.181	25	73.00	38.714	57	53.99	16.579	15	25.54	64.066	21	77.13
Oct. 7.4	36.122	59	74.43	38.599	115	56.14	16.529	80	26.09	64.011	55	78.62
17.4	36.036	86	75.56	38.494	165	58.17	16.449	80	26.76	63.926	85	79.80
		110			206			101			107	
27.3	35.926		76.39	38.228		59.97	16.348		27.51	63.819		80.70
Nov. 6.3	35.802	124	76.91	37.994	234	61.46	16.230	118	28.27	63.694	125	81.27
16.3	35.668	134	77.11	37.743	251	62.59	16.105	127	29.02	63.560	134	81.51
26.3	35.529	139	76.98	37.486	257	63.30	15.978	125	29.72	63.421	139	81.42
Dec. 6.2	35.392	137	76.55	37.234	252	63.56	15.855	123	30.35	63.283	138	81.02
		130			236			113			133	
16.2	35.262		75.81	36.998		63.36	15.742		30.89	63.150		80.31
26.2	35.143	119	74.79	36.786	212	62.69	15.640	102	31.31	63.029	121	79.31
36.2	35.039	104	73.52	36.605	181	61.58	15.556	84	31.58	62.922	107	78.04
Mean Place	31.883		42.77	32.835		72.77	11.957		51.42	59.749		46.83
Sec δ , Tan δ	1.087		+0.427	1.615		-1.269	1.031		-0.250	1.096		+0.449
$D\alpha$, $D\alpha$	+0.06		-0.03	+0.07		+0.08	+0.06		+0.02	+0.06		-0.03
$D\delta$, $D\delta$	+0.4		-0.3	+0.4		-0.3	+0.4		-0.3	+0.4		-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Cephei. Mag. 3.7		λ Aquarii. Mag. 3.8		ρ Indi. Mag. 6.1		δ Aquarii. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 46	° ' " +65 45	h m 22 48	° ' " - 8 0	h m 22 48	° ' " -70 30	h m 22 50	° ' " -16 15
Jan. 1.2	42.06	70.14	17.530	76.29	53.93	75.09	15.260	46.16
11.1	41.69	68.48	17.461	76.70	53.54	73.06	15.187	46.27
21.1	41.38	66.34	17.411	77.01	53.23	70.55	15.133	46.21
31.1	41.12	63.80	17.384	77.19	53.01	67.68	15.103	45.95
Feb. 10.1	40.95	60.98	17.381	77.22	52.88	64.50	15.098	45.51
20.0	40.86	57.99	17.407	77.07	52.84	61.11	15.122	44.86
Mar. 2.0	40.86	54.95	17.463	76.73	52.89	57.55	15.176	44.01
12.0	40.96	51.98	17.550	76.18	53.04	53.94	15.264	42.95
22.0	41.17	49.22	17.672	75.39	53.30	50.35	15.386	41.67
31.9	41.46	46.77	17.829	74.37	53.64	46.85	15.544	40.20
Apr. 10.9	41.84	44.73	18.019	73.11	54.07	43.50	15.736	38.55
20.9	42.30	43.18	18.243	71.66	54.58	40.39	15.963	36.75
30.8	42.82	42.16	18.497	70.00	55.17	37.56	16.220	34.82
May 10.8	43.38	41.73	18.777	68.19	55.82	35.10	16.503	32.81
20.8	43.98	41.89	19.077	66.27	56.51	33.04	16.809	30.77
30.8	44.59	42.63	19.390	64.29	57.24	31.43	17.128	28.74
June 9.7	45.20	43.93	19.709	62.28	57.99	30.31	17.454	26.77
19.7	45.79	45.76	20.026	60.32	58.73	29.70	17.778	24.92
29.7	46.35	48.07	20.331	58.44	59.45	29.61	18.093	23.25
July 9.7	46.85	50.79	20.620	56.69	60.12	30.06	18.389	21.77
19.6	47.30	53.87	20.882	55.13	60.74	31.00	18.660	20.53
29.6	47.67	57.21	21.114	53.77	61.28	32.42	18.900	19.55
Aug. 8.6	47.97	60.77	21.308	52.65	61.73	34.26	19.101	18.86
18.5	48.18	64.44	21.461	51.77	62.07	36.46	19.261	18.44
28.5	48.30	68.16	21.572	51.15	62.29	38.94	19.377	18.30
Sept. 7.5	48.34	71.86	21.640	50.76	62.39	41.61	19.449	18.41
17.5	48.30	75.45	21.667	50.62	62.38	44.37	19.477	18.76
27.4	48.18	78.86	21.655	50.68	62.23	47.11	19.465	19.30
Oct. 7.4	47.99	82.02	21.610	50.93	61.97	49.72	19.419	19.99
17.4	47.72	84.88	21.536	51.32	61.62	52.10	19.342	20.77
27.4	47.40	87.34	21.442	51.82	61.19	54.13	19.242	21.61
Nov. 6.3	47.04	89.35	21.332	52.40	60.69	55.74	19.125	22.45
16.3	46.64	90.87	21.212	53.03	60.15	56.85	19.000	23.26
26.3	46.21	91.83	21.090	53.68	59.59	57.41	18.871	24.00
Dec. 6.2	45.77	92.23	20.973	54.31	59.02	57.38	18.746	24.65
16.2	45.33	92.03	20.862	54.92	58.49	56.78	18.629	25.17
26.2	44.91	91.24	20.763	55.48	57.99	55.60	18.524	25.56
36.2	44.51	89.89	20.679	55.97	57.55	53.87	18.435	25.78
Mean Place	43.309	48.98	17.113	77.70	53.950	63.03	14.807	45.11
Sec δ , Tan δ	2.436	+2.222	1.010	-0.141	2.998	-2.826	1.042	-0.292
$D\psi\alpha$, $D_\omega\alpha$	+0.04	-0.14	+0.06	+0.01	+0.08	+0.18	+0.06	+0.02
$D\psi\delta$, $D_\omega\delta$	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

APPARENT PLACES OF STARS, 1917.

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FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Piscis Australis. (<i>Fomalhaut</i> .) Mag. 1.3		γ Andromedæ. Mag. 3.6		β Pegasi. Var. 2.2-2.7		α Pegasi. (<i>Markab</i> .) Mag. 2.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m s 22 53	° ' " 3	h m s 22 58	° ' " +41 52	h m s 22 59	° ' " +27 37	h m s 23 0	° ' " +14 45
Jan. 1.2	4.533	49.89	5.883	63.49	45.122	69.11	37.852	39.34
11.1	4.441	49.47	5.730	61.94	45.014	67.76	37.765	38.24
21.1	4.374	48.75	5.601	60.07	44.925	66.18	37.696	37.04
31.1	4.332	47.78	5.501	57.93	44.861	64.46	37.647	35.80
Feb. 10.1	4.320	46.54	5.438	55.62	44.825	62.66	37.624	34.57
20.0	4.340	45.08	5.417	53.24	44.821	60.87	37.629	33.42
Mar. 2.0	4.394	43.39	5.441	50.89	44.854	59.17	37.667	32.39
12.0	4.483	41.52	5.514	48.69	44.926	57.63	37.739	31.57
22.0	4.610	39.49	5.639	46.71	45.040	56.35	37.848	31.00
31.9	4.776	37.31	5.815	45.05	45.197	55.38	37.995	30.73
Apr. 10.9	4.980	35.04	6.041	43.79	45.395	54.79	38.179	30.79
20.9	5.221	32.72	6.313	42.98	45.631	54.60	38.400	31.19
30.8	5.494	30.38	6.625	42.66	45.903	54.84	38.654	31.95
May 10.8	5.797	28.09	6.970	42.84	46.205	55.51	38.934	33.06
20.8	6.123	25.91	7.338	43.53	46.528	56.58	39.237	34.48
30.8	6.465	23.86	7.721	44.71	46.865	58.06	39.554	36.19
June 9.7	6.817	22.00	8.108	46.33	47.208	59.88	39.877	38.13
19.7	7.167	20.40	8.490	48.37	47.549	62.01	40.199	40.27
29.7	7.507	19.07	8.856	50.75	47.877	64.38	40.510	42.53
July 9.7	7.831	18.06	9.196	53.43	48.184	66.93	40.803	44.86
19.6	8.127	17.39	9.503	56.33	48.464	69.60	41.071	47.21
29.6	8.389	17.07	9.771	59.40	48.709	72.33	41.309	49.52
Aug. 8.6	8.610	17.08	9.993	62.55	48.916	75.06	41.509	51.74
18.5	8.787	17.44	10.166	65.73	49.080	77.72	41.669	53.82
28.5	8.915	18.09	10.289	68.86	49.199	80.27	41.788	55.74
Sept. 7.5	8.994	19.00	10.360	71.87	49.274	82.67	41.865	57.46
17.5	9.024	20.14	10.382	74.74	49.306	84.87	41.901	58.96
27.4	9.010	21.42	10.358	77.38	49.298	86.84	41.900	60.21
Oct. 7.4	8.965	22.78	10.293	79.76	49.254	88.54	41.865	61.23
17.4	8.864	24.17	10.191	81.82	49.179	89.96	41.801	61.98
27.4	8.746	25.51	10.059	83.54	49.080	91.06	41.714	62.50
Nov. 6.3	8.610	26.73	9.902	84.86	48.960	91.84	41.611	62.75
16.3	8.461	27.80	9.728	85.77	48.828	92.28	41.495	62.77
26.3	8.309	28.66	9.543	86.22	48.688	92.37	41.374	62.53
Dec. 6.2	8.159	29.26	9.353	86.22	48.546	92.11	41.252	62.07
16.2	8.017	29.60	9.165	85.76	48.406	91.50	41.135	61.39
26.2	7.891	29.66	8.984	84.85	48.274	90.58	41.024	60.53
36.2	7.782	29.42	8.816	83.52	48.155	89.37	40.925	59.50
Mean Place	4.049	44.98	5.916	46.70	44.908	56.23	37.503	30.41
Sec δ , Tan δ	1.155	-0.579	1.343	+0.897	1.129	+0.524	1.084	+0.264
$D_{\psi} \alpha$, $D_{\psi} a$	+0.06	+0.04	+0.06	-0.06	+0.06	-0.03	+0.06	-0.02
$D_{\psi} \delta$, $D_{\psi} \delta$	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3	+0.4	-0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	55 Pegasi. Mag. 4.7		C ² Aquarii. Mag. 3.8		π Cephei. Mag. 4.6		γ Gruis. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 2	° ' " + 8 57	h m 23 5	° ' " -21 36	h m 23 5	° ' " +74 56	h m 23 5	° ' " -45 41
	s	"	s	"	s	"	s	"
Jan. 1.2	49.746 ⁸²	46.07 ⁹⁸	1.916 ⁸⁹	86.19 ⁵	13.10 ⁶⁸	42.50 ¹³²	40.447 ¹⁴⁹	56.35 ⁹⁶
11.2	49.664 ⁶⁵	45.14 ⁹⁹	1.827 ⁶⁸	86.14 ²⁹	12.42 ⁶⁰	41.18 ¹⁸⁷	40.293 ¹¹⁸	55.39 ¹³⁷
21.1	49.599 ⁴⁵	44.15 ⁹⁸	1.759 ⁴⁶	85.85 ⁵¹	11.82 ⁵⁰	39.31 ²³³	40.180 ⁸⁶	54.02 ¹⁷²
31.1	49.554 ²⁰	43.17 ⁹⁴	1.713 ²¹	85.34 ⁷⁴	11.32 ³⁹	36.98 ²⁷¹	40.095 ⁴⁹	52.30 ²⁰²
Feb. 10.1	49.534 ⁶	42.23 ⁸⁴	1.692 ⁷	84.60 ⁹⁶	10.93 ²⁴	34.27 ²⁰⁶	40.046 ⁹	50.27 ²³⁰
20.0	49.540	41.39 ⁶⁷	1.699	83.64 ¹¹⁹	10.69 ¹⁰	31.31 ³¹¹	40.037 ³⁴	47.97 ²⁵⁴
Mar. 2.0	49.577 ⁸⁷	40.72 ⁴⁸	1.738 ³⁹	82.45 ¹⁴⁰	10.59 ⁶	28.20 ³¹¹	40.071 ⁷⁸	45.43 ²⁷⁰
12.0	49.648 ⁷¹	40.24 ²²	1.811 ⁷³	81.05 ¹⁶¹	10.65 ²²	25.09 ²⁰⁸	40.149 ¹²⁶	42.73 ²⁸²
22.0	49.752 ¹⁰⁴	40.02 ⁵	1.919 ¹⁰⁸	79.44 ¹⁷⁸	10.87 ³⁶	22.11 ²⁷⁵	40.274 ¹⁷¹	39.91 ²⁹⁰
31.9	49.896 ¹⁴⁴	40.07 ²⁶	2.063 ¹⁴⁴	77.66 ¹⁹⁸	11.23 ⁵¹	19.36 ²⁴⁰	40.445 ²¹⁸	37.01 ²⁹⁰
Apr. 10.9	50.076 ²¹⁵	40.43 ⁶⁸	2.246 ²¹⁸	75.73 ²⁰⁶	11.74 ⁶⁵	16.96 ¹⁹⁶	40.663 ²⁶³	34.11 ²⁸⁶
20.9	50.291 ²⁴⁷	41.11 ⁹⁹	2.464 ²⁵²	73.67 ²¹⁵	12.39 ⁷⁴	15.00 ¹⁴⁵	40.926 ³⁰⁴	31.25 ²⁷⁶
30.9	50.538 ²⁷⁴	42.10 ¹³⁰	2.716 ²⁸⁰	71.52 ²¹⁹	13.13 ⁸²	13.55 ³⁸	41.230 ³⁴¹	28.49 ²⁵⁸
May 10.8	50.812 ²⁹⁷	43.40 ¹⁵⁷	2.996 ³⁰⁶	69.33 ²¹⁸	13.95 ⁸⁸	12.67 ³¹	41.571 ³⁷⁰	25.91 ²³⁷
20.8	51.109 ³¹¹	44.97 ¹⁷⁹	3.302 ³²²	67.15 ²¹⁰	14.83 ⁹¹	12.36 ²⁸	41.941 ³⁹³	23.54 ²⁰⁹
30.8	51.420 ³¹⁸	46.76 ¹⁹⁷	3.624 ³³¹	65.05 ²⁰⁰	15.74 ⁹²	12.64 ⁸⁷	42.334 ⁴⁰⁵	21.45 ¹⁷⁸
June 9.7	51.738 ³¹⁸	48.73 ²¹²	3.955 ³³³	63.05 ¹⁸⁴	16.66 ⁸⁹	13.51 ¹⁴⁴	42.739 ⁴⁰⁸	19.69 ¹⁴¹
19.7	52.056 ³⁰⁷	50.85 ²¹⁹	4.288 ³²⁷	61.21 ¹⁶²	17.55 ⁸⁵	14.95 ¹⁹⁵	43.147 ⁴⁰¹	18.28 ⁹⁹
29.7	52.363 ²⁹²	53.04 ²²⁰	4.615 ³¹⁰	59.59 ¹³⁸	18.40 ⁷⁸	16.90 ²⁴²	43.548 ³⁸³	17.29 ⁵⁷
July 9.7	52.655 ²⁶⁷	55.24 ²¹⁸	4.925 ²⁸⁷	58.21 ¹⁰⁸	19.18 ⁶⁶	19.32 ²⁸²	43.931 ³⁵⁵	16.72 ¹³
19.6	52.922 ²³⁸	57.42 ²⁰⁹	5.212 ²⁵⁵	57.13 ⁷⁸	19.86 ⁶⁰	22.14 ³¹⁸	44.286 ³¹⁷	16.59 ²⁹
29.6	53.160 ²⁰²	59.51 ¹⁹⁷	5.467 ²¹⁹	56.35 ⁴⁸	20.46 ⁴⁸	25.32 ³⁴⁵	44.603 ²⁷¹	16.88 ⁷¹
Aug. 8.6	53.362 ¹⁶²	61.48 ¹⁸¹	5.686 ¹⁷⁸	55.87 ¹⁵	20.94 ³⁶	28.77 ³⁶⁴	44.874 ²¹⁹	17.59 ¹¹⁰
18.6	53.524 ¹²¹	63.29 ¹⁶⁰	5.864 ¹³³	55.72 ¹⁵	21.30 ²⁴	32.41 ³⁸¹	45.093 ¹⁶²	18.69 ¹⁴²
28.5	53.645 ⁸⁰	64.89 ¹⁴⁰	5.997 ⁸⁸	55.87 ⁴¹	21.54 ⁹	36.18 ³⁸¹	45.255 ¹⁰²	20.11 ¹⁷¹
Sept. 7.5	53.725 ⁴⁰	66.29 ¹¹⁶	6.085 ⁴⁴	56.28 ⁶⁶	21.63 ²	39.99 ³⁷⁸	45.357 ⁴¹	21.82 ¹⁹¹
17.5	53.765 ³	67.45 ⁹⁴	6.129 ²	56.94 ⁸⁴	21.61 ¹⁵	43.77 ³⁶⁶	45.398 ¹⁶	23.73 ²⁰²
27.4	53.768 ³²	68.39 ⁶⁸	6.131 ³⁷	57.78 ⁹⁹	21.46 ²⁸	47.43 ³⁴⁸	45.382 ⁶⁹	25.75 ²⁰⁶
Oct. 7.4	53.736 ⁶⁰	69.07 ⁴⁷	6.094 ⁶⁹	58.77 ¹⁰⁷	21.18 ³⁷	50.91 ³²²	45.313 ¹¹⁵	27.81 ²⁰¹
17.4	53.676 ⁸³	69.54 ²³	6.025 ⁹⁵	59.84 ¹⁰⁹	20.81 ⁴⁸	54.13 ²⁸⁷	45.198 ¹⁵⁴	29.82 ¹⁸⁶
27.4	53.593 ⁹⁹	69.77 ³	5.930 ¹¹⁵	60.93 ¹⁰⁷	20.33 ⁵⁶	57.00 ²⁴⁶	45.044 ¹⁸²	31.68 ¹⁶³
Nov. 6.3	53.494 ¹¹¹	69.80 ¹⁷	5.815 ¹²⁶	62.00 ⁹⁹	19.77 ⁶⁴	59.46 ¹⁹⁹	44.862 ²⁰²	33.31 ¹³⁵
16.3	53.383 ¹¹⁶	69.63 ³⁶	5.689 ¹³³	62.99 ⁸⁷	19.13 ⁶⁹	61.45 ¹⁴⁴	44.660 ²¹³	34.66 ⁹⁸
26.3	53.267 ¹¹⁷	69.27 ⁵³	5.556 ¹³²	63.86 ⁷¹	18.44 ⁷⁴	62.89 ⁸⁷	44.447 ²¹¹	35.64 ⁵⁸
Dec. 6.3	53.150 ¹¹³	68.74 ⁶⁸	5.424 ¹²⁶	64.57 ⁵³	17.70 ⁷⁵	63.76 ²⁶	44.236 ²⁰⁵	36.22 ¹⁶
16.2	53.037 ¹⁰⁶	68.06 ⁸¹	5.298 ¹¹⁶	65.10 ⁸¹	16.95 ⁷⁴	64.02 ⁸⁶	44.031 ¹⁹⁰	36.38 ²⁷
26.2	52.931 ⁹⁴	67.25 ⁹¹	5.182 ¹⁰²	65.41 ¹⁰	16.21 ⁷¹	63.66 ⁹⁷	43.841 ¹⁶⁷	36.11 ⁷⁰
36.2	52.837	66.34	5.080	65.51	15.50	62.69	43.674	35.41
Mean Place	49.342	38.97	1.376	83.65	15.234	19.07	39.922	47.69
Sec δ, Tan δ	1.012	+0.158	1.076	-0.396	3.850	+3.718	1.432	-1.024
D ₁ α, D ₂ α	+0.06	-0.01	+0.06	+0.03	+0.04	-0.24	+0.07	+0.07
D ₁ δ, D ₂ δ	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	59 Pegasi. Mag. 5.2			5 H ¹ . Cassiopeia. Mag. 5.6			φ Aquarii. Mag. 4.4			ψ Aquarii. Mag. 4.5		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	23 7		+ 8 16	23 9		+56 42	23 10		- 6 29	23 11		- 9 31
Jan. 1.2	33.156		16.17	16.539		56.74	1.974		45.88	33.208		82.75
11.2	33.072	84	15.26	16.287	252	55.29	1.893	81	46.35	33.126	82	83.14
21.1	33.005	67	14.32	16.066	181	53.40	1.826	67	46.73	33.061	65	83.38
31.1	32.956	49	13.37	15.885	121	51.13	1.782	44	46.99	33.015	46	83.49
Feb. 10.1	32.932	24	12.48	15.754	131	48.57	1.760	22	47.11	32.992	23	83.43
20.0	32.933	1	11.69	15.681	73	45.84	1.762	2	47.05	32.994	2	83.18
Mar. 2.0	32.966	33	11.06	15.675	6	43.06	1.795	33	46.79	33.027	33	82.74
12.0	33.032	66	10.63	15.737	62	40.31	1.861	66	46.30	33.092	65	82.07
22.0	33.134	103	10.44	15.873	136	37.76	1.959	96	45.61	33.189	97	81.18
31.9	33.271	137	10.54	16.079	206	35.48	2.094	135	44.66	33.324	135	80.05
Apr. 10.9	33.447	176	10.92	16.355	276	33.57	2.265	171	43.48	33.496	173	78.71
20.9	33.658	211	11.63	16.694	339	32.11	2.473	206	42.07	33.702	206	77.16
30.9	33.901	243	12.65	17.087	393	31.17	2.712	239	40.44	33.940	238	75.43
May 10.8	34.172	271	13.95	17.525	438	30.76	2.979	267	38.68	34.209	269	73.55
20.8	34.466	310	15.53	17.995	491	30.91	3.270	291	36.78	34.500	291	71.57
30.8	34.776	310	17.32	18.486	491	31.61	3.577	307	34.77	34.809	309	69.53
June 9.7	35.094	318	19.28	18.983	497	32.84	3.894	317	32.74	35.127	318	67.49
19.7	35.412	318	21.39	19.479	500	34.58	4.212	318	30.72	35.447	320	65.49
29.7	35.721	309	23.57	19.942	499	36.77	4.524	312	28.78	35.762	315	63.58
July 9.7	36.015	294	25.77	20.381	439	39.35	4.819	295	26.96	36.061	299	61.82
19.6	36.284	269	27.92	20.778	397	42.27	5.092	273	25.30	36.339	278	60.26
29.6	36.525	241	29.98	21.126	348	45.45	5.338	246	23.81	36.587	248	58.91
Aug. 8.6	36.730	206	31.92	21.417	291	48.81	5.547	209	22.57	36.801	214	57.81
18.6	36.897	167	33.69	21.647	230	52.31	5.719	172	21.59	36.977	176	56.96
28.5	37.023	126	35.26	21.812	165	55.85	5.852	133	20.84	37.111	134	56.40
Sept. 7.5	37.108	83	36.62	21.912	100	59.35	5.940	88	20.39	37.204	93	56.10
17.5	37.153	45	37.74	21.948	36	62.77	5.990	50	20.14	37.255	51	56.03
27.4	37.160	7	38.64	21.923	25	66.02	5.999	9	20.11	37.266	11	56.20
Oct. 7.4	37.133	27	39.29	21.842	81	69.04	5.976	23	20.30	37.242	24	56.55
17.4	37.078	55	39.72	21.706	133	71.78	5.921	55	20.67	37.189	53	57.05
27.4	36.999	79	39.93	21.531	173	74.15	5.844	77	21.16	37.110	79	57.67
Nov. 6.3	36.903	96	39.94	21.315	216	76.11	5.745	99	21.72	37.014	96	58.37
16.3	36.795	108	39.74	21.070	151	77.62	5.637	108	22.36	36.905	109	59.10
26.3	36.681	114	39.38	20.801	245	78.62	5.524	113	23.03	36.789	116	59.83
Dec. 6.3	36.565	116	38.86	20.520	281	79.09	5.408	116	23.71	36.673	116	60.52
16.2	36.452	113	38.18	20.233	287	79.01	5.295	113	24.38	36.560	113	61.17
26.2	36.347	105	37.39	19.951	262	78.38	5.192	108	25.01	36.455	105	61.74
36.2	36.252	96	36.51	19.682	260	77.23	5.098	94	25.57	36.361	94	62.22
Mean Place	32.720		9.18	16.897		35.99	1.450		48.06	32.666		83.99
Sec δ, Tan δ	1.011		+0.145	1.822		+1.523	1.006		-0.114	1.014		-0.168
D ₁ α, D ₂ α	+0.06		-0.01	+0.05		-0.10	+0.06		+0.01	+0.06		+0.01
D ₁ δ, D ₂ δ	+0.4		-0.2	+0.4		-0.2	+0.4		-0.2	+0.4		-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tucanae. Mag. 4.1		γ Piscium. Mag. 3.8		γ Sculptoris. Mag. 4.5		α Cephei. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 12	° ' " -58 40	h m 23 12	° ' " + 2 49	h m 23 14	° ' " -32 58	h m 23 15	° ' " +67 39
Jan. 1.2	36.035	99.83	52.229	48.24	21.281	69.56	11.75	49.02
11.2	35.791 ²⁴⁴	98.44 ¹³⁹	52.147 ⁸²	47.49 ⁷⁵	21.168 ¹¹³	69.14 ⁴²	11.32 ⁴³	47.73 ¹²⁹
21.1	35.588 ²⁰⁸	96.59 ¹⁸⁵	52.061 ⁶⁶	46.75 ⁷⁴	21.075 ⁹⁸	68.39 ⁷⁵	10.93 ³⁹	45.92 ¹⁸¹
31.1	35.431 ¹⁵⁷	94.93 ²²⁶	52.033 ⁴⁸	46.07 ⁶⁸	21.008 ⁶⁷	67.34 ¹⁰⁵	10.60 ³³	43.66 ²²⁵
Feb. 10.1	35.326 ¹⁰⁵	91.72 ²⁶¹	52.008 ²⁵	45.47 ⁶⁰	20.967 ⁴¹	66.00 ¹⁸⁴	10.35 ²⁵	41.03 ²⁶³
20.1	35.277 ⁴⁹	88.84 ²⁸⁸	52.008 ⁰	44.99 ⁴⁸	20.959 ⁸	64.39 ¹⁶¹	10.19 ¹⁶	38.17 ²⁸⁶
Mar. 2.0	35.285 ⁸	85.72 ³¹²	52.088 ³⁰	44.70 ³⁹	20.985 ²⁶	62.55 ¹⁸⁴	10.12 ⁷	35.18 ²⁹⁹
12.0	35.354 ⁶⁹	82.46 ³²⁶	52.100 ⁶²	44.59 ¹¹	21.048 ⁶⁸	60.49 ²⁰⁶	10.16 ⁴	32.19 ²⁹⁹
22.0	35.485 ¹³¹	79.12 ³³⁴	52.197 ⁹⁷	44.74 ¹⁵	21.150 ¹⁰²	58.26 ²²⁸	10.30 ¹⁴	29.31 ²⁸⁸
31.9	35.680 ¹⁹⁵	75.77 ³³⁵	52.331 ¹³⁴	45.14 ⁴⁰	21.291 ¹⁴¹	55.89 ²³⁷	10.55 ²⁵	26.68 ²⁶³
Apr. 10.9	35.935 ²⁵⁵	72.46 ³³¹	52.501 ¹⁷⁰	45.83 ⁶⁹	21.474 ¹⁸⁸	53.43 ²⁴⁶	10.90 ³⁵	24.40 ²²⁸
20.9	36.249 ³¹⁴	69.28 ³¹⁸	52.707 ²⁰⁶	46.78 ⁹⁵	21.697 ²²³	50.91 ²⁵³	11.34 ⁴⁴	22.54 ¹⁸⁶
30.9	36.617 ³⁶⁸	66.29 ²⁹⁹	52.945 ²⁸⁸	48.02 ¹²⁴	21.957 ²⁶⁰	48.39 ²⁵³	11.85 ⁵¹	21.18 ¹³⁶
May 10.8	37.033 ⁴¹⁶	63.55 ²⁷⁴	53.213 ²⁶⁸	49.50 ¹⁴⁸	22.251 ²⁹⁴	45.92 ²⁴⁷	12.43 ⁵⁸	20.36 ⁸²
20.8	37.490 ⁴⁵⁷	61.12 ²⁴³	53.503 ²⁹⁰	51.20 ¹⁷⁰	22.571 ³²⁰	43.56 ²³⁶	13.06 ⁶³	20.11 ²⁵
30.8	37.977 ⁴⁸⁷	59.06 ²⁰⁶	53.812 ³⁰⁹	53.08 ¹⁸⁸	22.912 ³⁴¹	41.37 ²¹⁹	13.71 ⁶⁵	20.45 ³⁴
June 9.8	38.482 ⁵⁰⁵	57.42 ¹⁶⁴	54.128 ³¹⁶	55.08 ²⁰⁰	23.267 ³⁵⁵	39.38 ¹⁹⁹	14.37 ⁶⁶	21.37 ⁹²
19.7	38.993 ⁵¹¹	56.23 ¹¹⁹	54.447 ³¹⁹	57.15 ²⁰⁷	23.625 ³⁵⁸	37.67 ¹⁷¹	15.02 ⁶⁵	22.82 ¹⁴⁵
29.7	39.498 ⁵⁰⁵	55.52 ⁷¹	54.758 ³¹¹	59.26 ²¹¹	23.976 ³⁵¹	36.26 ¹⁴¹	15.65 ⁶³	24.78 ¹⁹⁶
July 9.7	39.981 ⁴⁸³	55.30 ²²	55.054 ²⁹⁶	61.32 ²⁰⁶	24.314 ³³⁸	35.20 ¹⁰⁸	16.23 ⁵⁸	27.19 ²⁴¹
19.6	40.431 ⁴⁵⁰	55.59 ²⁹	55.328 ²⁷⁴	63.31 ¹⁹⁹	24.628 ³¹⁴	34.51 ⁶⁹	16.76 ⁵³	29.99 ²⁸⁹
29.6	40.835 ⁴⁰⁴	56.36 ⁷⁷	55.573 ²⁴⁵	65.18 ¹⁸⁷	24.911 ²⁸³	34.19 ³²	17.22 ⁴⁶	33.14 ³¹⁵
Aug. 8.6	41.181 ³⁴⁶	57.58 ¹²²	55.784 ²¹¹	66.86 ¹⁶⁸	25.155 ²⁴⁴	34.24 ⁵	17.61 ³⁹	36.53 ³³⁹
18.6	41.460 ²⁷⁹	59.21 ¹⁶³	55.958 ¹⁷⁴	68.36 ¹⁵⁰	25.355 ²⁰⁰	34.66 ⁴²	17.90 ⁴⁰	40.11 ³⁵⁸
28.5	41.666 ²⁰⁶	61.19 ¹⁹⁸	56.090 ¹³²	69.63 ¹²⁷	25.507 ¹⁵²	35.42 ⁷⁶	18.11 ²¹	43.80 ³⁶⁹
Sept. 7.5	41.793 ¹²⁷	63.45 ²²⁶	56.183 ⁹³	70.67 ¹⁰⁴	25.610 ¹⁰³	36.47 ¹⁰⁵	18.23 ¹²	47.52 ³⁷²
17.5	41.840 ⁴⁷	65.88 ²⁴³	56.235 ⁵²	71.47 ⁸⁰	25.663 ⁵³	37.76 ¹²⁹	18.27 ⁴	51.20 ³⁶⁸
27.5	41.810 ³⁰	68.40 ²⁵²	56.249 ¹⁴	72.05 ⁵⁸	25.669 ⁶	39.22 ¹⁴⁵	18.22 ⁵	54.75 ³⁵⁵
Oct. 7.4	41.706 ¹⁰⁴	70.90 ²⁵⁰	56.229 ⁴⁰	72.40 ³⁵	25.631 ³⁸	40.79 ¹⁵⁷	18.08 ¹⁴	58.13 ³³⁸
17.4	41.537 ¹⁶⁹	73.29 ²³⁹	56.180 ²⁹	72.54 ¹⁴	25.555 ⁷⁶	42.39 ¹⁸⁰	17.86 ²²	61.23 ³¹⁰
27.4	41.312 ²²⁵	75.45 ²¹⁶	56.107 ⁷³	72.49 ⁵	25.447 ¹⁰⁸	43.95 ¹⁵⁶	17.58 ²⁸	64.00 ²⁷⁷
Nov. 6.3	41.042 ²⁷⁰	77.30 ¹⁸⁵	56.016 ⁹¹	72.27 ²²	25.316 ¹⁸¹	45.39 ¹⁴⁴	17.24 ³⁴	66.35 ³³⁵
16.3	40.741 ³⁰¹	78.75 ¹⁴⁵	55.913 ¹⁰³	71.91 ³⁶	25.169 ¹⁴⁷	46.65 ¹²⁶	16.85 ³⁹	68.26 ¹⁹¹
26.3	40.423 ³¹⁸	79.75 ¹⁰⁰	55.804 ¹⁰⁹	71.43 ⁴⁸	25.013 ¹⁵⁶	47.68 ¹⁰⁸	16.42 ⁴³	69.63 ¹³⁷
Dec. 6.3	40.099 ³²⁴	80.25 ⁵⁰	55.692 ¹¹²	70.84 ⁵⁹	24.855 ¹⁵⁸	48.43 ⁷⁵	15.96 ⁴⁶	70.44 ⁸¹
16.2	39.783 ³¹⁶	80.22 ³	55.583 ¹⁰⁹	70.18 ⁶⁶	24.701 ¹⁵⁴	48.89 ⁴⁶	15.49 ⁴⁷	70.67 ²⁸
26.2	39.486 ²⁹⁷	79.66 ⁵⁶	55.480 ¹⁰³	69.44 ⁷⁴	24.557 ¹⁴⁴	49.01 ¹²	15.02 ⁴⁷	70.30 ³⁷
36.2	39.216 ²⁷⁰	78.60 ¹⁰⁶	55.386 ⁹⁴	68.68 ⁷⁶	24.429 ¹²⁸	48.80 ²¹	14.57 ⁴⁵	69.33 ⁹⁷
Mean Place	35.551	88.76	51.731	42.94	20.684	63.88	12.670	26.07
Sec δ , Tan δ	1.924	-1.644	1.001	+0.049	1.192	-0.649	2.631	+2.434
$D\psi\alpha$, $D_\omega\alpha$	+0.07	+0.11	+0.06	0.00	+0.06	+0.04	+0.05	-0.16
$D\psi\delta$, $D_\omega\delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Pegasi. Mag. 4.6			δ Aquarii. Mag. 4.2			ϵ Cassiopeiae. Mag. 5.2			υ Pegasi. Mag. 4.6		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	23 16		+23 17	23 18		-20 32	23 21		+61 49	23 21		+22 56
	s		"	s		"	s		"	s		"
Jan. 1.2	31.962		20.96	37.969		76.21	8.16		59.47	14.478		61.05
11.2	31.856 ¹⁰⁶		19.77 ¹¹⁹	37.274 ⁹⁵		76.25 ⁴	7.84 ³³		58.19 ¹²⁸	14.371 ¹⁰⁷		59.90 ¹¹⁵
21.1	31.764 ⁹²		18.40 ¹³⁷	37.197 ⁷⁷		76.05 ²⁰	7.54 ³⁰		56.41 ¹⁷⁸	14.278 ⁹³		58.57 ¹³³
31.1	31.694 ⁷⁰		16.91 ¹⁴⁹	37.139 ⁵⁴		75.63 ⁴²	7.29 ²⁵		54.20 ²²¹	14.206 ⁷²		57.11 ¹⁴⁶
Feb. 10.1	31.647 ⁴⁷		15.35 ¹⁵⁶	37.105 ³⁴		74.97 ⁶⁶	7.09 ²⁰		51.66 ²⁵⁴	14.156 ⁵⁰		55.59 ¹⁵²
	16		155	7		88	13		276	20		151
20.1	31.631		13.80	37.098		74.09	6.96		48.90	14.136		54.08
Mar. 2.0	31.648 ¹⁷		12.34 ¹⁴⁶	37.122 ²⁴		72.96 ¹¹³	6.91 ⁵		46.02 ²⁸⁸	14.150 ¹⁴		52.65 ¹⁴³
12.0	31.703 ⁵⁵		11.04 ¹⁸⁰	37.179 ⁵⁷		71.63 ¹³³	6.94 ³		43.15 ²⁸⁷	14.199 ⁴⁹		51.39 ¹²⁶
22.0	31.796 ⁹³		9.98 ¹⁰⁶	37.270 ⁹¹		70.08 ¹⁵⁵	7.06 ¹²		40.40 ²⁷⁵	14.288 ⁸⁹		50.34 ¹⁰⁵
31.9	31.932 ¹³⁶		9.21 ⁷⁷	37.400 ¹³⁰		68.34 ¹⁷⁴	7.26 ²⁰		37.91 ²⁴⁹	14.419 ¹³¹		49.58 ⁷⁶
	177		45	168		191	29		216	172		44
Apr. 10.9	32.109		8.76	37.568		66.43	7.55		35.75	14.591		49.14
20.9	32.326 ²¹⁷		8.70 ⁶	37.772 ²⁰⁴		64.38 ²⁰⁸	7.90 ³⁵		34.02 ¹⁷³	14.804 ²¹³		49.08 ⁶
30.9	32.580 ²⁵⁴		9.04 ³⁴	38.010 ²³⁸		62.23 ²⁴⁵	8.32 ⁴²		32.78 ¹²⁴	15.054 ²⁵⁰		49.41 ³³
May 10.8	32.863 ²⁸³		9.77 ⁷³	38.280 ²⁷⁰		60.03 ²²⁰	8.80 ⁴⁸		32.07 ⁷¹	15.334 ²⁸⁰		50.13 ⁷²
20.8	33.172 ³⁰⁹		10.88 ¹¹¹	38.577 ²⁹⁷		57.82 ²²¹	9.32 ⁵²		31.92 ¹⁵	15.641 ³⁰⁷		51.23 ¹¹⁰
	326		144	314		216	54		42	324		143
30.8	33.498		12.34	38.891		55.66	9.86		32.34	15.965		52.66
June 9.8	33.833 ³³⁵		14.12 ¹⁷³	39.218 ³²⁷		53.60 ²⁰⁶	10.42 ⁵⁶		33.32 ⁹⁸	16.299 ³³⁴		54.41 ¹⁷⁵
19.7	34.168 ³³⁵		16.17 ²⁰⁵	39.549 ³³¹		51.69 ¹⁹¹	10.97 ⁵⁵		34.82 ¹⁵⁰	16.634 ³³⁵		56.44 ²⁰³
29.7	34.495 ³²⁷		18.42 ²²⁵	39.875 ³²⁵		49.98 ¹⁷¹	11.50 ⁵³		36.80 ¹⁹⁸	16.962 ³²⁸		58.68 ²²⁴
July 9.7	34.804 ³⁰⁹		20.84 ²⁴²	40.187 ³¹³		48.51 ¹⁴⁷	12.00 ⁵⁰		39.22 ²⁴²	17.273 ³¹¹		61.06 ²³⁸
	287		251	292		119	45		278	289		248
19.6	35.091		23.35	40.479		47.32	12.45		42.00	17.562		63.54
29.6	35.345 ²⁵⁴		25.89 ²⁵⁴	40.742 ²⁶³		46.42 ⁹⁰	12.85 ⁴⁰		45.10 ³¹⁰	17.820 ²⁵⁸		66.07 ²⁵³
Aug. 8.6	35.563 ²¹⁸		28.42 ²⁵³	40.971 ²²⁹		45.85 ⁵⁷	13.19 ³⁴		48.43 ³³³	18.043 ²²³		68.58 ²⁵¹
18.6	35.742 ¹⁷⁹		30.88 ²⁴⁶	41.160 ¹⁸⁹		45.60 ²⁵	13.46 ³⁷		51.94 ³⁵¹	18.227 ¹⁸⁴		71.01 ²⁴³
28.5	35.878 ¹³⁶		33.22 ²³⁴	41.306 ¹⁴⁶		45.65 ⁵	13.65 ¹⁹		55.53 ³⁵⁹	18.370 ¹⁴³		73.33 ²³²
	95		217	101		35	13		361	99		215
Sept. 7.5	35.973		35.39	41.407		46.00	13.78 ⁵		59.14	18.469		75.48
17.5	36.025 ⁵²		37.37 ¹⁹⁸	41.464 ⁵⁷		46.59 ⁸⁹	13.83 [—]		62.68 ³⁵⁴	18.527 ⁵⁸		77.45 ¹⁹⁷
27.5	36.038 ¹³		39.13 ¹⁷⁶	41.480 ¹⁶		47.40 ⁸¹	13.81 ²		66.11 ³⁴³	18.546 ¹⁹		79.19 ¹⁷⁴
Oct. 7.4	36.015 ²³		40.63 ¹⁵⁰	41.457 ²³		48.36 ⁹⁸	13.73 ⁸		69.35 ³²⁴	18.528 ¹⁸		80.69 ¹⁵⁰
17.4	35.962 ⁵³		41.87 ¹³⁴	41.401 ⁵⁶		49.43 ¹⁰⁷	13.58 ¹⁵		72.31 ²⁹⁶	18.480 ⁴⁸		81.92 ¹²³
	80		96	84		111	20		262	75		96
27.4	35.882		42.83	41.317		50.54	13.38		74.93	18.405		82.88
Nov. 6.3	35.782 ¹⁰⁰		43.49 ⁶⁶	41.213 ¹⁰⁴		51.64 ¹¹⁰	13.12 ²⁶		77.17 ²²⁴	18.310 ⁹⁵		83.53 ⁶⁵
16.3	35.667 ¹¹⁵		43.85 ³⁶	41.093 ¹²⁰		52.68 ¹⁰⁴	12.83 ²⁹		78.95 ¹⁷⁸	18.199 ¹¹¹		83.90 ³⁷
26.3	35.542 ¹²⁵		43.91 ⁶	40.966 ¹²⁷		53.62 ⁹⁴	12.51 ³²		80.23 ¹²⁸	18.077 ¹²²		83.97 ⁷
Dec. 6.3	35.413 ¹²⁹		43.66 ²⁵	40.837 ¹²⁹		54.41 ⁷⁹	12.17 ³⁴		80.97 ⁷⁴	17.950 ¹²⁷		83.74 ²³
	130		53	126		90	36		17	128		51
16.2	35.283		43.13	40.711		55.01	11.81		81.14	17.822		83.23
26.2	35.158 ¹²⁵		42.31 ⁸²	40.593 ¹¹⁸		55.43 ⁴²	11.46 ³⁵		80.74 ⁴⁰	17.697 ¹²⁵		82.44 ⁷⁹
36.2	35.042 ¹¹⁶		41.23 ¹⁰⁸	40.485 ¹⁰⁸		55.61 ¹⁸	11.11 ³⁵		79.76 ⁹⁸	17.581 ¹¹⁶		81.42 ¹⁰²
Mean Place	31.586		8.86	36.761		74.07	8.592		37.20	14.067		48.93
Sec δ , Tan δ	1.089		+0.430	1.068		-0.375	2.118		+1.868	1.086		+0.423
$D_{\phi} \alpha$, $D_{\alpha} \alpha$	+0.06		-0.03	+0.06		+0.02	+0.05		-0.12	+0.06		-0.03
$D_{\phi} \delta$, $D_{\alpha} \delta$	+0.4		-0.2	+0.4		-0.2	+0.4		-0.2	+0.4		-0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Piscium. Mag. 4.9			θ Piscium. Mag. 4.4			70 Pegasi. Mag. 4.7			β Sculptoris. Mag. 4.5		
	Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.		Right Ascension.	Declina- tion.	
	h m 23 22	° ' " + 0 48		h m 23 23	° ' " + 5 55		h m 23 24	° ' " +12 18		h m 23 28	° ' " -38 16	
	s "	"		s "	"		s "	"		s "	"	
Jan. 1.2	41.222	8.89	45.961	29.80	57.852	17.84	32.131	46.44				
11.2	41.135 87	8.20 60	45.871 90	28.49 81	57.757 95	16.89 95	31.993 128	45.93 51				
21.1	41.062 73	7.54 66	45.796 75	27.66 83	57.675 82	15.86 108	31.876 117	45.03 90				
31.1	41.005 57	6.94 60	45.736 60	26.85 81	57.612 68	14.80 106	31.783 93	43.79 134				
Feb. 10.1	40.971 34	6.45 49	45.698 38	26.11 74	57.569 43	13.75 105	31.720 63	42.22 157				
	10 10	36	12 12	63 63	16 16	98 98	31 31	186 186				
20.1	40.961	6.09	45.686	25.48	57.553	12.77	31.689	40.36				
Mar. 2.0	40.980 19	5.91 18	45.703 17	24.99 49	57.567 14	11.92 85	31.693 4	38.24 213				
12.0	41.030 50	5.93 2	45.752 49	24.71 26	57.613 46	11.26 44	31.736 43	35.91 233				
22.0	41.116 86	6.20 27	45.837 85	24.66 5	57.697 123	10.82 66	31.821 85	33.39 233				
31.9	41.239 123	6.71 51	45.959 122	24.88 22	57.820 84	10.66 16	31.950 129	30.74 265				
	100 100	79 79	180 180	49 49	162 162	15 15	173 173	273 273				
Apr. 10.9	41.399	7.50	46.119	25.37	57.982	10.81	32.123	28.01				
20.9	41.596 197	8.56 106	46.315 196	26.17 80	58.182 200	11.27 46	32.339 216	25.25 276				
30.9	41.826 230	9.87 131	46.545 230	27.26 109	58.416 244	12.07 80	32.596 257	22.52 273				
May 10.8	42.087 261	11.42 155	46.807 262	28.61 135	58.682 266	13.19 112	32.890 294	19.88 264				
20.8	42.372 285	13.16 174	47.093 286	30.21 160	58.973 291	14.60 141	33.214 324	17.38 250				
	304 304	180 180	306 306	180 180	310 310	167 167	350 350	281 281				
30.8	42.676	15.05	47.398	32.01	59.283	16.27	33.564	15.07				
June 9.8	42.991 315	17.06 201	47.713 315	33.97 196	59.603 320	18.16 189	33.929 365	13.02 306				
19.7	43.309 318	19.13 207	48.031 318	36.05 208	59.925 322	20.23 207	34.302 373	11.28 174				
29.7	43.621 312	21.20 207	48.344 313	38.17 212	60.242 317	22.40 217	34.673 371	9.89 130				
July 9.7	43.919 298	23.22 202	48.642 298	40.30 213	60.545 308	24.64 234	35.031 358	8.88 101				
	279 279	193 193	279 279	207 207	283 283	234 234	338 338	61 61				
19.6	44.198 251	25.15 179	48.921 251	42.37 197	60.827 283	26.88 219	35.369 306	8.27 18				
29.6	44.449 217	26.94 159	49.172 218	44.34 184	61.080 280	29.07 210	35.675 268	8.09 28				
Aug. 8.6	44.666 180	28.53 140	49.390 181	46.18 165	61.300 293	31.17 190	35.943 234	8.32 63				
18.6	44.846 142	29.93 116	49.571 142	47.83 145	61.483 143	33.13 186	36.167 175	8.94 97				
28.5	44.988 101	31.09 92	49.713 101	49.28 121	61.626 102	34.93 158	36.342 123	9.91 130				
Sept. 7.5	45.089 60	32.01 68	49.814 61	50.49 100	61.728 62	36.51 137	36.465 70	11.21 156				
17.5	45.149 23	32.69 45	49.875 23	51.49 75	61.790 24	37.88 113	36.535 19	12.77 174				
27.5	45.172 12	33.14 22	49.898 11	52.24 53	61.814 10	39.01 91	36.554 29	14.51 194				
Oct. 7.4	45.160 41	33.36 3	49.887 40	52.77 30	61.804 40	39.92 65	36.525 71	16.35 187				
17.4	45.119 67	33.39 14	49.847 66	53.07 11	61.764 65	40.57 43	36.454 108	18.22 181				
27.4	45.052 84	33.25 81	49.781 84	53.18 8	61.699 84	41.00 20	36.346 136	20.03 167				
Nov. 6.3	44.968 99	32.94 43	49.697 99	53.10 26	61.615 100	41.20 1	36.210 156	21.70 147				
16.3	44.869 107	32.51 54	49.598 107	52.84 41	61.515 109	41.19 24	36.054 170	23.17 118				
26.3	44.762 111	31.97 61	49.491 112	52.43 53	61.406 113	40.95 42	35.884 175	24.35 85				
Dec. 6.3	44.651 110	31.36 67	49.379 112	51.90 65	61.293 115	40.53 60	35.709 174	25.20 51				
16.2	44.541 106	30.69 72	49.267 107	51.25 75	61.178 111	39.93 77	35.535 165	25.71 12				
26.2	44.435 97	29.97 72	49.160 99	50.50 81	61.067 105	39.16 90	35.370 153	25.83 26				
36.2	44.338	29.25	49.061	49.69	60.962	38.26	35.217	25.57				
Mean Place	40.659	4.07	45.418	22.75	57.938	9.10	31.456	39.40				
Sec δ , Tan δ	1.000	+0.014	1.005	+0.104	1.024	+0.218	1.274	-0.789				
$D_{\psi} \alpha$, $D_{\psi} \alpha$	+0.06	0.00	+0.06	-0.01	+0.06	-0.01	+0.06	+0.05				
$D_{\psi} \delta$, $D_{\psi} \delta$	+0.4	-0.2	+0.4	-0.2	+0.4	-0.2	+0.4	-0.1				

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	78 Pegasi (mean). Mag. 5.2		λ Andromedæ. Mag. 4.0		ϵ Andromedæ. Mag. 4.3		ϵ Piscium. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 29	° ' " +30 52	h m 23 33	° ' " +46 0	h m 23 34	° ' " +42 48	h m 23 35	° ' " + 5 10
Jan. 1.2	50.324	16.70	30.044	49.44	3.942	49.01	41.442	41.29
11.2	50.196	15.50	29.856	48.21	3.769	47.79	41.349	40.50
21.1	50.063	14.06	29.686	46.59	3.613	46.20	41.267	39.70
31.1	49.988	12.41	29.539	44.64	3.479	44.32	41.201	38.93
Feb. 10.1	49.920	10.63	29.426	42.44	3.376	42.20	41.154	38.24
20.1	49.882	8.80	29.354	40.09	3.311	39.95	41.132	37.65
Mar. 2.0	49.879	7.00	29.328	37.68	3.289	37.66	41.137	37.20
12.0	49.918	5.33	29.354	35.31	3.316	35.43	41.175	36.96
22.0	50.000	3.84	29.436	33.11	3.396	33.37	41.248	36.94
Apr. 1.0	50.127	2.63	29.576	31.15	3.530	31.56	41.359	37.19
10.9	50.299	1.76	29.772	29.52	3.719	30.08	41.509	37.70
20.9	50.515	1.26	30.023	28.30	3.959	29.00	41.696	38.51
30.9	50.772	1.18	30.322	27.52	4.245	28.37	41.919	39.60
May 10.8	51.063	1.53	30.663	27.23	4.571	28.22	42.174	40.95
20.8	51.382	2.31	31.037	27.44	4.930	28.55	42.456	42.54
30.8	51.721	3.50	31.435	28.16	5.311	29.36	42.758	44.33
June 9.8	52.072	5.06	31.844	29.35	5.704	30.64	43.072	46.27
19.7	52.424	6.95	32.256	30.99	6.106	32.34	43.392	48.31
29.7	52.770	9.13	32.659	33.03	6.488	34.42	43.708	50.41
July 9.7	53.100	11.54	33.043	35.41	6.857	36.81	44.011	52.50
19.7	53.406	14.13	33.398	38.09	7.199	39.48	44.297	54.54
29.6	53.682	16.81	33.717	40.98	7.506	42.35	44.556	56.47
Aug. 8.6	53.921	19.54	33.993	44.05	7.773	45.36	44.784	58.28
18.6	54.119	22.26	34.222	47.19	7.995	48.44	44.976	59.86
28.5	54.274	24.92	34.399	50.36	8.168	51.53	45.129	61.26
Sept. 7.5	54.385	27.45	34.525	53.50	8.291	54.55	45.248	62.43
17.5	54.453	29.83	34.600	56.53	8.366	57.47	45.317	63.37
27.5	54.479	31.99	34.625	59.41	8.393	60.22	45.353	64.06
Oct. 7.4	54.467	33.92	34.603	62.07	8.376	62.75	45.355	64.54
17.4	54.422	35.59	34.540	64.47	8.320	65.02	45.326	64.79
27.4	54.346	36.97	34.441	66.55	8.229	66.97	45.273	64.85
Nov. 6.4	54.248	38.02	34.308	68.27	8.107	68.57	45.197	64.72
16.3	54.130	38.73	34.149	69.58	7.962	69.79	45.107	64.43
26.3	53.998	39.09	33.970	70.46	7.797	70.58	45.007	64.00
Dec. 6.3	53.858	39.10	33.777	70.89	7.619	70.93	44.900	63.45
16.2	53.715	38.74	33.576	70.85	7.434	70.84	44.790	62.80
26.2	53.572	38.04	33.374	70.33	7.247	70.29	44.683	62.06
36.2	53.434	37.01	33.175	69.34	7.065	69.32	44.581	61.27
Mean Place	49.929	1.86	29.829	30.22	3.667	30.57	40.825	34.77
Sec δ , Tan δ	1.165	+0.598	1.440	+1.036	1.363	+0.926	1.004	+0.091
$D\psi\alpha$, $D_\alpha\alpha$	+0.06	-0.04	+0.06	-0.07	+0.06	-0.06	+0.06	-0.01
$D\psi\delta$, $D_\alpha\delta$	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cephei. Mag. 3.4		κ Andromedæ. Mag. 4.3		ω^2 Aquarii. Mag. 4.6		ι^1 Aquarii. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 35	° ' " +77 10	h m 23 36	° ' " +43 52	h m 23 38	° ' " -14 59	h m 23 39	° ' " -18 43
	s "	"	s "	"	s "	"	s "	"
Jan. 1.2	54.17	33.91	19.213	45.91	25.846	74.02	54.614	77.35
11.2	53.34	33.04	19.035	44.72	25.747	74.29	54.511	77.53
21.2	52.56	31.57	18.873	43.15	25.660	74.38	54.420	77.48
31.1	51.87	29.58	18.733	41.27	25.591	74.27	54.347	77.19
Feb. 10.1	51.31	27.15	18.625	39.14	25.541	73.94	54.294	76.68
20.1	50.90	24.38	18.555	36.87	25.516	73.40	54.267	75.91
Mar. 2.0	50.65	21.38	18.529	34.56	25.519	72.62	54.267	74.92
12.0	50.57	18.29	18.553	32.29	25.554	71.62	54.300	73.69
22.0	50.69	15.24	18.630	30.19	25.624	70.39	54.368	72.24
Apr. 1.0	50.99	12.33	18.763	28.32	25.731	68.94	54.474	70.57
10.9	51.47	9.69	18.952	26.79	25.876	67.28	54.619	68.72
20.9	52.11	7.42	19.192	25.65	26.059	65.45	54.802	66.71
30.9	52.89	5.60	19.480	24.96	26.280	63.47	55.023	64.57
May 10.8	53.78	4.29	19.808	24.74	26.533	61.37	55.277	62.36
20.8	54.76	3.54	20.171	25.01	26.813	59.21	55.559	60.11
30.8	55.80	3.37	20.556	25.77	27.117	57.04	55.864	57.88
June 9.8	56.87	3.78	20.955	26.99	27.434	54.91	56.184	55.74
19.7	57.93	4.77	21.356	28.65	27.758	52.87	56.511	53.71
29.7	58.95	6.30	21.749	30.70	28.081	50.98	56.838	51.86
July 9.7	59.92	8.33	22.125	33.07	28.392	49.28	57.155	50.25
19.7	60.81	10.82	22.473	35.73	28.687	47.81	57.453	48.89
29.6	61.60	13.70	22.786	38.59	28.955	46.62	57.727	47.84
Aug. 8.6	62.27	16.91	23.059	41.62	29.193	45.71	57.969	47.10
18.6	62.81	20.39	23.286	44.71	29.394	45.11	58.174	46.67
28.5	63.22	24.05	23.464	47.82	29.555	44.82	58.339	46.58
Sept. 7.5	63.48	27.83	23.592	50.88	29.673	44.81	58.461	46.79
17.5	63.59	31.65	23.670	53.84	29.750	45.08	58.540	47.27
27.5	63.56	35.43	23.701	56.64	29.787	45.57	58.578	47.99
Oct. 7.4	63.38	39.09	23.686	59.22	29.788	46.28	58.578	48.89
17.4	63.07	42.54	23.631	61.55	29.754	47.12	58.543	49.92
27.4	62.62	45.71	23.540	63.56	29.693	48.05	58.479	51.03
Nov. 6.4	62.06	48.55	23.418	65.21	29.610	49.04	58.393	52.17
16.3	61.40	50.94	23.271	66.48	29.510	50.02	58.289	53.27
26.3	60.65	52.84	23.103	67.32	29.399	50.95	58.172	54.28
Dec. 6.3	59.84	54.18	22.922	67.72	29.281	51.79	58.050	55.17
16.2	58.98	54.92	22.733	67.67	29.163	52.50	57.926	55.89
26.2	58.10	55.04	22.541	67.16	29.048	53.08	57.806	56.43
36.2	57.24	54.53	22.356	66.21	28.940	53.50	57.694	56.75
Mean Place	55.858	8.83	18.934	27.14	25.143	73.76	53.896	75.92
Sec δ , Tan δ	4.505	+4.393	1.387	+0.962	1.035	-0.268	1.056	-0.339
D ϕ α , D α α	+0.05	-0.29	+0.06	-0.06	+0.06	+0.02	+0.06	+0.02
D ϕ δ , D α δ	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1	+0.4	-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Andromedæ. Mag. 5.1			ϵ H. Cephei. Mag. 5.0			δ Sculptoris. Mag. 4.6			ϕ Pegasi. Mag. 5.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	23 41		+45 57	23 43		+67 20	23 44		-28 34	23 48		+18 39
Jan. 1.2	55.267		58.08	55.62		67.99	37.001		87.29	16.406		44.77
11.2	55.076	191	51.95	55.18	44	67.04	36.880	121	87.21	16.295	110	43.81
21.2	54.899	177	50.41	54.77	41	65.56	36.772	108	86.81	16.194	101	42.71
31.1	54.747	152	48.55	54.40	37	63.59	36.682	90	86.09	16.107	87	41.50
Feb. 10.1	54.636	121	46.42	54.10	30	61.22	36.616	66	85.09	16.041	66	40.25
20.1	54.543	83	44.12	53.88	22	58.53	36.575	41	83.80	15.998	43	39.01
Mar. 2.0	54.506	37	41.75	53.75	13	55.66	36.566	9	82.25	15.986	12	37.86
12.0	54.520	14	39.41	53.72	3	52.71	36.592	26	80.45	16.008	22	36.84
22.0	54.590	70	37.22	53.80	8	49.81	36.655	63	78.44	16.068	60	36.03
Apr. 1.0	54.718	128	35.24	53.98	18	47.07	36.758	103	76.24	16.169	101	35.46
10.9	54.904	186	33.59	54.26	28	44.62	36.902	144	73.90	16.313	144	35.20
20.9	55.145	241	32.33	54.65	39	42.54	37.066	184	71.45	16.497	184	35.27
30.9	55.436	291	31.51	55.11	46	40.91	37.311	225	68.94	16.720	223	35.68
May 10.9	55.769	333	31.16	55.65	54	39.78	37.572	261	66.43	16.979	259	36.45
20.8	56.139	370	31.31	56.25	60	39.20	37.865	293	63.96	17.266	287	37.55
30.8	56.533	394	31.95	56.88	68	39.19	38.182	317	61.60	17.577	311	38.96
June 9.8	56.943	410	33.07	57.54	66	39.74	38.515	333	59.41	17.901	324	40.66
19.7	57.356	413	34.63	58.20	66	40.84	38.859	344	57.43	18.231	330	42.58
29.7	57.762	406	36.60	58.85	65	42.45	39.203	344	55.73	18.559	328	44.69
July 9.7	58.150	388	38.93	59.46	61	44.54	39.538	335	54.33	18.877	318	46.92
19.7	58.511	361	41.55	60.03	57	47.06	39.856	318	53.29	19.175	298	49.23
29.6	58.839	328	44.39	60.55	52	49.94	40.148	292	52.61	19.449	274	51.56
Aug. 8.6	59.125	286	47.42	61.00	45	53.13	40.407	259	52.30	19.690	241	53.84
18.6	59.364	239	50.54	61.35	35	56.53	40.627	220	52.37	19.896	206	56.05
28.6	59.554	190	53.69	61.64	29	60.11	40.805	178	52.79	20.063	167	58.12
Sept. 7.5	59.692	138	56.82	61.84	20	63.76	40.937	132	53.55	20.190	127	60.04
17.5	59.779	87	59.85	61.96	12	67.43	41.022	85	54.59	20.277	87	61.76
27.5	59.816	37	62.75	61.99	3	71.03	41.063	41	55.87	20.327	50	63.27
Oct. 7.4	59.807	9	65.44	61.94	5	74.48	41.063	0	57.30	20.340	13	64.54
17.4	59.757	50	67.87	61.81	13	77.74	41.023	40	58.83	20.322	18	65.58
27.4	59.667	90	70.00	61.59	22	80.70	40.950	73	60.39	20.276	46	66.37
Nov. 6.4	59.545	122	71.78	61.32	27	83.31	40.852	98	61.89	20.206	70	66.91
16.3	59.396	149	73.18	61.00	32	85.49	40.733	119	63.28	20.119	87	67.19
26.3	59.223	173	74.15	60.62	38	87.19	40.600	133	64.50	20.017	102	67.23
Dec. 6.3	59.036	187	74.66	60.20	42	88.36	40.460	140	65.49	19.905	112	67.01
16.3	58.838	198	74.70	59.76	44	88.96	40.317	143	66.20	19.787	118	66.57
26.2	58.635	203	74.28	59.30	46	88.95	40.177	140	66.64	19.668	119	65.89
36.2	58.436	199	73.39	58.85	45	88.36	40.045	132	66.77	19.551	117	65.03
Mean Place	54.967		33.59	55.971		43.89	36.240		82.88	15.780		33.40
Sec δ , Tan δ	1.439		+1.034	2.597		+2.396	1.139		-0.545	1.056		+0.338
$D\psi\alpha$, $D_m\alpha$	+0.06		-0.07	+0.06		-0.16	+0.06		+0.04	+0.06		-0.02
$D\psi\delta$, $D_m\delta$	+0.4		-0.1	+0.4		-0.1	+0.4		-0.1	+0.4		-0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ρ Cassiopeiæ. Mag. 4.8		Groombridge 4163. Mag. 6.6		ω Piscium. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 50	° ' " +57 2	h m 23 50	° ' " +73 56	h m 23 55	° ' " + 6 24
Jan. 1.2	13.877	37.82	45.73	79.44	3.625	21.17
11.2	13.597 ²⁸⁰	36.85 ⁹⁷	45.07 ⁶⁶	78.70 ⁷⁴	3.524 ¹⁰¹	20.41 ⁷⁶
21.2	13.336 ²⁶¹	35.39 ¹⁴⁶	44.45 ⁶²	77.88 ¹³²	3.431 ⁹³	19.62 ⁷⁹
31.1	13.103 ²³³	33.50 ¹⁸⁹	43.89 ⁵⁶	75.53 ¹⁸⁵	3.351 ⁸⁰	18.85 ⁷⁷
Feb. 10.1	12.912 ¹⁹¹	31.26 ²²⁴	43.43 ⁴⁶	73.22 ²³¹	3.289 ⁶²	18.14 ⁷¹
	141	250	36	266	42	63
20.1	12.771 ⁸¹	28.76 ²⁶⁵	43.07 ²⁴	70.56 ²⁰⁰	3.247 ¹³	17.51 ⁴⁸
Mar. 2.0	12.690 ¹⁵	26.11 ²⁶⁹	42.83 ⁹	67.66 ³⁰³	3.234 ¹⁸	17.03 ³⁰
12.0	12.675 ⁶⁰	23.42 ²⁶¹	42.74 ⁶	64.63 ³⁰²	3.252 ⁵³	16.73 ¹⁰
22.0	12.735 ¹³⁵	20.81 ²⁴³	42.80 ²¹	61.61 ²⁹⁰	3.305 ⁹¹	16.63 ¹⁷
Apr. 1.0	12.870 ²⁰⁸	18.38 ²¹⁴	43.01 ³⁵	58.71 ²⁶⁵	3.396 ¹³¹	16.80 ⁴³
10.9	13.078 ²⁷⁹	16.24 ¹⁷⁷	43.36 ⁴⁰	56.06 ²³²	3.527 ¹⁷¹	17.23 ⁷²
20.9	13.357 ³⁴²	14.47 ¹³³	43.85 ⁶⁰	53.74 ¹⁸⁹	3.698 ²⁰⁹	17.95 ¹⁰⁰
30.9	13.699 ³⁹⁸	13.14 ⁸⁴	44.45 ⁷¹	51.85 ¹³⁸	3.907 ²⁴²	18.95 ¹²⁸
May 10.9	14.097 ⁴⁴³	12.30 ³³	45.16 ⁷⁸	50.47 ⁹⁶	4.149 ²⁷²	20.23 ¹⁵¹
20.8	14.540 ⁴⁷⁵	11.97 ²¹	45.94 ⁸⁴	49.61 ²⁹	4.421 ²⁹⁵	21.74 ¹⁷³
30.8	15.015 ⁴⁹⁵	12.18 ⁷⁴	46.78 ⁸⁸	49.32 ²⁹	4.716 ³¹²	23.47 ¹⁸⁹
June 9.8	15.510 ⁵⁰⁰	12.92 ¹²⁶	47.66 ⁸⁸	49.61 ⁸⁵	5.028 ³¹⁹	25.36 ²⁰²
19.7	16.010 ⁴⁹²	14.18 ¹⁷²	48.54 ⁸⁶	50.46 ¹⁴¹	5.347 ³¹⁹	27.38 ²⁰⁸
29.7	16.502 ⁴⁷¹	15.90 ²¹⁶	49.40 ⁸⁸	51.87 ¹⁹⁰	5.666 ³⁰⁹	29.46 ²¹⁰
July 9.7	16.973 ⁴⁴¹	18.06 ²⁵³	50.23 ⁷⁷	53.77 ²³⁵	5.975 ²⁹⁴	31.56 ²⁰⁶
19.7	17.414 ⁴⁰¹	20.59 ²⁸³	51.00 ⁶⁰	56.12 ²⁷⁶	6.269 ²⁷⁰	33.62 ¹⁹⁷
29.6	17.815 ³⁵¹	23.42 ³¹⁰	51.69 ⁶¹	58.88 ³¹¹	6.539 ²⁴²	35.59 ¹⁸³
Aug. 8.6	18.166 ²⁹⁶	26.52 ³²⁷	52.30 ⁶⁰	61.99 ³³⁷	6.781 ²⁰⁷	37.42 ¹⁶⁶
18.6	18.462 ²³⁵	29.79 ³³⁹	52.80 ³⁰	65.36 ³⁵⁹	6.988 ¹⁷¹	39.08 ¹⁴⁸
28.6	18.697 ¹⁷⁴	33.18 ³⁴³	53.19 ²⁸	68.95 ³⁷⁰	7.159 ¹³²	40.56 ¹²⁴
Sept. 7.5	18.871 ¹¹²	36.61 ³⁴¹	53.47 ¹⁷	72.65 ³⁷⁶	7.291 ⁹⁴	41.80 ¹⁰²
17.5	18.983 ⁵⁰	40.02 ³³¹	53.64 ⁴	76.41 ³⁷³	7.385 ⁵⁶	42.82 ⁷⁷
27.5	19.033 ¹⁰	43.33 ³¹⁴	53.68 ⁷	80.14 ³⁶⁴	7.441 ²⁰	43.59 ⁵⁵
Oct. 7.4	19.023 ⁶⁵	46.47 ²⁹³	53.61 ¹⁸	83.78 ³⁴⁵	7.461 ³⁸	44.14 ³⁴
17.4	18.958 ¹¹⁶	49.40 ²⁶⁴	53.43 ²⁰	87.23 ³¹⁹	7.452 ³⁸	44.48 ¹²
27.4	18.842 ¹⁶¹	52.04 ²²⁹	53.14 ³⁸	90.42 ²⁸⁶	7.414 ⁶⁰	44.60 ⁶
Nov. 6.4	18.681 ²⁰¹	54.33 ¹⁸⁹	52.76 ⁴⁸	93.28 ²⁴⁵	7.354 ⁷⁸	44.54 ²³
16.3	18.480 ²³³	56.22 ¹⁴³	52.28 ⁵⁵	95.73 ¹⁹⁷	7.276 ⁹²	44.31 ³⁸
26.3	18.247 ²⁶¹	57.65 ⁹²	51.73 ⁶⁰	97.70 ¹⁴³	7.184 ¹⁰¹	43.93 ⁵⁰
Dec. 6.3	17.986 ²⁷⁸	58.57 ⁴¹	51.13 ⁶⁵	99.13 ⁸⁵	7.083 ¹⁰⁷	43.43 ⁶¹
16.3	17.708 ²⁸⁷	58.98 ¹⁴	50.48 ⁶⁸	99.98 ²⁵	6.976 ¹⁰⁹	42.82 ⁷¹
26.2	17.421 ²⁸⁸	58.84 ⁶⁷	49.80 ⁶⁷	100.23 ³⁸	6.867 ¹⁰⁷	42.11 ⁷⁶
36.2	17.133	58.17	49.13	99.85	6.760	41.35
Mean Place	13.711	15.48	46.464	54.22	2.897	13.92
Sec δ , Tan δ	1.838	+1.542	3.618	+3.477	1.006	+0.112
$D\psi\alpha$, $D_{\omega}\alpha$	+0.06	-0.10	+0.06	-0.23	+0.06	-0.01
$D\psi\delta$, $D_{\omega}\delta$	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Tucane. Mag. 4.7		30 Piscium. Mag. 4.7		2 Ceti. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 55	° ' " -66 1	h m 23 57	° ' " - 6 28	h m 23 50	° ' " -17 47
Jan. 1.2	37.54	91.37	42.998	28.42	30.163	54.22
11.2	37.14	90.24	42.897	28.95	30.053	54.49
21.2	36.77	88.56	42.805	29.36	29.951	54.54
31.1	36.45	86.40	42.725	29.63	29.864	54.35
Feb. 10.1	36.19	83.81	42.663	29.75	29.795	53.93
20.1	36.00	80.85	42.621	29.70	29.746	53.25
Mar. 2.1	35.88	77.61	42.606	29.43	29.729	52.34
12.0	35.82	74.14	42.621	28.95	29.740	51.18
22.0	35.86	70.56	42.670	28.23	29.766	49.79
Apr. 1.0	35.98	66.91	42.757	27.29	29.871	48.17
10.9	36.17	63.27	42.883	26.10	29.994	46.36
20.9	36.45	59.74	43.048	24.70	30.158	44.37
30.9	36.81	56.36	43.250	23.07	30.361	42.24
May 10.9	37.23	53.24	43.486	21.27	30.598	40.02
20.8	37.72	50.41	43.753	19.33	30.868	37.75
30.8	38.26	47.96	44.043	17.29	31.163	35.47
June 9.8	38.84	45.94	44.351	15.20	31.476	33.25
19.8	39.44	44.39	44.667	13.11	31.800	31.16
29.7	40.05	43.36	44.985	11.08	32.126	29.21
July 9.7	40.66	42.88	45.295	9.16	32.446	27.49
19.7	41.24	42.93	45.590	7.40	32.749	26.03
29.6	41.78	43.52	45.864	5.84	33.033	24.86
Aug. 8.6	42.26	44.63	46.109	4.51	33.287	24.02
18.6	42.67	46.23	46.320	3.45	33.566	23.49
28.6	42.99	48.25	46.494	2.66	33.687	23.30
Sept. 7.5	43.23	50.61	46.630	2.13	33.829	23.42
17.5	43.37	53.25	46.726	1.88	33.927	23.83
27.5	43.42	56.05	46.783	1.88	33.985	24.51
Oct. 7.5	43.36	58.90	46.804	2.11	34.004	25.40
17.4	43.20	61.69	46.792	2.52	33.989	26.43
27.4	42.97	64.29	46.754	3.08	33.944	27.57
Nov. 6.4	42.67	66.63	46.691	3.76	33.873	28.74
16.3	42.30	68.57	46.610	4.51	33.782	29.90
26.3	41.89	70.06	46.516	5.29	33.677	30.98
Dec. 6.3	41.46	71.02	46.413	6.07	33.561	31.96
16.3	41.01	71.41	46.304	6.82	33.441	32.79
26.2	40.57	71.22	46.194	7.50	33.320	33.42
36.2	40.14	70.45	46.065	8.11	33.203	33.85
Mean Place	36.742	79.02	42.213	31.21	29.339	53.22
Sec δ, Tan δ	2.462	-2.250	1.006	-0.113	1.050	-0.321
D _ψ α, D _α α	+0.06	+0.15	+0.06	+0.01	+0.06	+0.02
D _ψ δ, D _α δ	+0.4	0.0	+0.4	0.0	+0.4	0.0

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Jan. 1	18 46 47.50	11.041	-23 0 53.2	+12.34	+ 3 40.62	+1.182	16 17.87	1 11.05	18 43 6.28
2	18 51 12.32	11.027	22 55 43.3	13.48	4 8.82	1.167	16 17.88	1 11.00	18 47 2.84
3	18 55 36.77	11.010	22 50 6.1	14.61	4 36.63	1.150	16 17.88	1 10.95	18 50 59.39
4	19 0 0.82	10.998	22 44 1.6	15.75	5 4.05	1.133	16 17.88	1 10.90	18 54 55.95
5	19 4 24.45	10.975	22 37 30.1	16.87	5 31.04	1.115	16 17.87	1 10.84	18 58 52.51
6	19 8 47.62	10.958	-22 30 31.9	+17.98	+ 5 57.58	+1.096	16 17.85	1 10.78	19 2 49.07
7	19 13 10.33	10.936	22 23 7.0	19.09	6 23.66	1.076	16 17.82	1 10.72	19 6 45.63
8	19 17 32.53	10.914	22 15 15.7	20.18	6 49.23	1.054	16 17.79	1 10.65	19 10 42.18
9	19 21 54.20	10.892	22 6 58.1	21.27	7 14.29	1.032	16 17.76	1 10.57	19 14 38.74
10	19 26 15.34	10.869	21 58 14.7	22.35	7 38.80	1.010	16 17.72	1 10.49	19 18 35.90
11	19 30 35.92	10.845	-21 49 5.4	+23.42	+ 8 2.75	+0.986	16 17.67	1 10.41	19 22 31.86
12	19 34 55.90	10.820	21 39 30.6	24.47	8 26.12	0.962	16 17.62	1 10.33	19 26 28.42
13	19 39 15.29	10.794	21 29 30.7	25.52	8 48.89	0.935	16 17.56	1 10.25	19 30 24.97
14	19 43 34.06	10.768	21 19 5.9	26.55	9 11.04	0.909	16 17.50	1 10.16	19 34 21.53
15	19 47 52.19	10.741	21 8 16.3	27.57	9 32.55	0.882	16 17.42	1 10.07	19 38 18.09
16	19 52 9.66	10.714	-20 57 2.4	+28.58	+ 9 53.40	+0.856	16 17.34	1 9.97	19 42 14.65
17	19 56 26.45	10.685	20 45 24.4	29.58	10 13.58	0.827	16 17.26	1 9.88	19 46 11.21
18	20 0 42.55	10.656	20 33 22.7	30.55	10 33.08	0.798	16 17.18	1 9.78	19 50 7.76
19	20 4 57.95	10.626	20 20 57.6	31.53	10 51.85	0.768	16 17.09	1 9.68	19 54 4.32
20	20 9 12.62	10.595	20 8 9.3	32.48	11 9.92	0.737	16 17.00	1 9.58	19 58 0.88
21	20 13 26.55	10.564	-19 54 58.4	+33.42	+11 27.25	+0.706	16 16.90	1 9.47	20 1 57.43
22	20 17 39.72	10.533	19 41 25.3	34.33	11 43.81	0.674	16 16.80	1 9.37	20 5 53.99
23	20 21 52.11	10.500	19 27 30.1	35.24	11 59.60	0.642	16 16.70	1 9.26	20 9 50.55
24	20 26 3.72	10.467	19 13 13.4	36.14	12 14.61	0.609	16 16.59	1 9.15	20 13 47.11
25	20 30 14.52	10.433	18 58 35.6	37.00	12 28.82	0.575	16 16.48	1 9.04	20 17 43.66
26	20 34 24.50	10.399	-18 43 36.9	+37.86	+12 42.21	+0.541	16 16.37	1 8.93	20 21 40.22
27	20 38 33.67	10.365	18 28 18.0	38.70	12 54.79	0.507	16 16.25	1 8.81	20 25 36.78
28	20 42 42.00	10.330	18 12 39.2	39.52	13 6.52	0.472	16 16.13	1 8.70	20 29 33.33
29	20 46 49.50	10.295	17 56 40.8	40.33	13 17.43	0.438	16 16.00	1 8.59	20 33 29.89
30	20 50 56.15	10.260	17 40 23.2	41.12	13 27.50	0.408	16 15.88	1 8.47	20 37 26.44
31	20 55 1.96	10.225	-17 23 46.9	+41.89	+13 36.73	+0.368	16 15.74	1 8.36	20 41 23.00
Feb. 1	20 59 6.93	10.190	17 6 52.3	42.65	13 45.12	0.333	16 15.61	1 8.24	20 45 19.56
2	21 3 11.07	10.155	16 49 39.7	43.39	13 52.68	0.298	16 15.46	1 8.13	20 49 16.11
3	21 7 14.36	10.121	16 32 9.5	44.11	13 59.40	0.263	16 15.32	1 8.01	20 53 12.67
4	21 11 16.83	10.086	16 14 22.2	44.82	14 5.29	0.229	16 15.16	1 7.90	20 57 9.22
5	21 15 18.48	10.052	-15 56 18.2	+45.51	+14 10.37	+0.195	16 15.00	1 7.79	21 1 5.78
6	21 19 19.30	10.018	15 37 57.8	46.18	14 14.63	0.161	16 14.83	1 7.67	21 5 2.34
7	21 23 19.32	9.984	15 19 21.4	46.84	14 18.08	0.127	16 14.66	1 7.56	21 8 58.89
8	21 27 18.54	9.951	15 0 29.4	47.48	14 20.74	0.094	16 14.49	1 7.45	21 12 55.45
9	21 31 16.97	9.918	14 41 22.1	48.11	14 22.60	0.061	16 14.31	1 7.34	21 16 52.00
10	21 35 14.61	9.886	-14 22 0.3	+48.72	+14 23.69	+0.029	16 14.12	1 7.23	21 20 48.56
11	21 39 11.49	9.854	14 2 23.9	49.30	14 24.01	-0.003	16 13.94	1 7.12	21 24 45.11
12	21 43 7.60	9.823	13 42 33.6	49.88	14 23.58	0.034	16 13.75	1 7.01	21 28 41.67
13	21 47 2.98	9.792	13 22 29.6	50.44	14 22.40	0.064	16 13.55	1 6.90	21 32 38.22
14	21 50 57.62	9.762	13 2 12.4	50.98	14 20.48	0.094	16 13.35	1 6.79	21 36 34.78
15	21 54 51.64	9.732	-12 41 42.6	+51.50	+14 17.85	-0.124	16 13.14	1 6.68	21 40 31.33
16	21 58 44.74	9.703	-12 21 0.4	+52.01	+14 14.51	-0.153	16 12.93	1 6.58	21 44 27.89

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Feb.									
16	21 58 44.74	9.703	-12 21 0.4	+52.01	+14 14.51	-0.153	16 12.93	1 6.58	21 44 27.89
17	22 2 37.25	9.674	12 0 6.1	52.50	14 10.48	0.182	16 12.72	1 6.48	21 48 24.45
18	22 6 29.07	9.645	11 39 0.4	52.97	14 5.76	0.211	16 12.51	1 6.38	21 52 21.00
19	22 10 20.21	9.617	11 17 43.7	53.41	14 0.37	0.239	16 12.29	1 6.28	21 56 17.55
20	22 14 10.69	9.589	10 56 16.3	53.85	13 54.31	0.266	16 12.07	1 6.18	22 0 14.11
21	22 18 0.51	9.562	-10 34 38.6	+54.27	+13 47.59	-0.293	16 11.85	1 6.09	22 4 10.66
22	22 21 49.70	9.536	10 12 51.2	54.67	13 40.24	0.320	16 11.63	1 5.99	22 8 7.21
23	22 25 38.24	9.509	9 50 54.5	55.05	13 32.25	0.346	16 11.41	1 5.90	22 12 3.77
24	22 29 26.16	9.484	9 28 48.9	55.40	13 23.63	0.371	16 11.19	1 5.81	22 16 0.32
25	22 33 13.47	9.459	9 6 34.9	55.75	13 14.41	0.396	16 10.96	1 5.73	22 19 56.88
26	22 37 0.17	9.434	-8 44 13.0	+56.08	+13 4.60	-0.421	16 10.73	1 5.64	22 23 53.43
27	22 40 46.30	9.410	8 21 43.4	56.38	12 54.20	0.445	16 10.50	1 5.56	22 27 49.98
28	22 44 31.86	9.387	7 59 6.6	56.67	12 43.24	0.468	16 10.27	1 5.49	22 31 46.54
Mar.									
1	22 48 16.89	9.365	7 36 23.0	56.95	12 31.73	0.490	16 10.04	1 5.41	22 35 43.09
2	22 52 1.38	9.344	7 13 32.9	57.21	12 19.70	0.511	16 9.80	1 5.34	22 39 39.65
3	22 55 45.36	9.323	-6 50 36.7	+57.46	+12 7.17	-0.533	16 9.56	1 5.27	22 43 36.20
4	22 59 28.86	9.303	6 27 35.0	57.68	11 54.14	0.552	16 9.32	1 5.21	22 47 32.75
5	23 3 11.87	9.283	6 4 28.0	57.89	11 40.66	0.571	16 9.08	1 5.14	22 51 29.31
6	23 6 54.46	9.265	5 41 16.0	58.09	11 26.72	0.590	16 8.83	1 5.08	22 55 25.86
7	23 10 36.62	9.248	5 17 59.4	58.28	11 12.36	0.606	16 8.58	1 5.02	22 59 22.41
8	23 14 18.38	9.232	-4 54 38.6	+58.44	+10 57.61	-0.622	16 8.32	1 4.96	23 3 18.97
9	23 17 59.76	9.217	4 31 14.0	58.59	10 42.48	0.638	16 8.06	1 4.91	23 7 15.52
10	23 21 40.79	9.202	4 7 46.0	58.74	10 27.00	0.652	16 7.80	1 4.85	23 11 12.07
11	23 25 21.48	9.189	3 44 14.8	58.85	10 11.18	0.666	16 7.53	1 4.81	23 15 8.63
12	23 29 1.85	9.177	3 20 40.8	58.96	9 55.06	0.678	16 7.27	1 4.76	23 19 5.18
13	23 32 41.96	9.166	-2 57 4.5	+59.06	+9 38.64	-0.689	16 7.00	1 4.72	23 23 1.73
14	23 36 21.79	9.155	2 33 26.1	59.13	9 21.97	0.700	16 6.73	1 4.68	23 26 58.28
15	23 40 1.38	9.145	2 9 45.9	59.20	9 5.05	0.709	16 6.46	1 4.64	23 30 54.84
16	23 43 40.75	9.136	1 46 4.5	59.25	8 47.91	0.718	16 6.18	1 4.60	23 34 51.39
17	23 47 19.93	9.129	1 22 22.2	59.27	8 30.59	0.725	16 5.91	1 4.57	23 38 47.94
18	23 50 58.94	9.123	-0 58 39.2	+59.29	+8 13.09	-0.732	16 5.63	1 4.55	23 42 44.50
19	23 54 37.77	9.116	0 34 56.0	59.30	7 55.43	0.738	16 5.36	1 4.53	23 46 41.05
20	23 58 16.48	9.110	-0 11 13.0	59.27	7 37.63	0.744	16 5.08	1 4.51	23 50 37.60
21	0 1 55.07	9.105	+0 12 29.3	59.24	7 19.72	0.749	16 4.80	1 4.49	23 54 34.16
22	0 5 33.55	9.101	0 36 10.7	59.20	7 1.68	0.753	16 4.53	1 4.47	23 58 30.71
23	0 9 11.94	9.096	+0 59 50.7	+59.13	+6 43.56	-0.756	16 4.25	1 4.46	0 2 27.26
24	0 12 50.25	9.096	1 23 29.0	59.05	6 25.38	0.759	16 3.98	1 4.45	0 6 23.81
25	0 16 28.51	9.094	1 47 5.1	58.95	6 7.14	0.761	16 3.71	1 4.44	0 10 20.37
26	0 20 6.72	9.092	2 10 38.8	58.84	5 48.84	0.762	16 3.43	1 4.44	0 14 16.92
27	0 23 44.91	9.091	2 34 9.5	58.71	5 30.53	0.763	16 3.16	1 4.44	0 18 13.47
28	0 27 23.10	9.091	+2 57 37.0	+58.57	+5 12.22	-0.763	16 2.89	1 4.44	0 22 10.03
29	0 31 1.29	9.092	3 21 0.9	58.41	4 53.91	0.762	16 2.62	1 4.44	0 26 6.58
30	0 34 39.52	9.094	3 44 20.7	58.24	4 35.63	0.760	16 2.35	1 4.45	0 30 3.13
31	0 38 17.80	9.097	4 7 36.4	58.06	4 17.41	0.757	16 2.08	1 4.46	0 33 59.69
Apr.									
1	0 41 56.15	9.100	4 30 47.4	57.86	3 59.26	0.754	16 1.81	1 4.48	0 37 56.24
2	0 45 34.60	9.104	+4 53 53.4	+57.64	+3 41.20	-0.750	16 1.54	1 4.49	0 41 52.79
3	0 49 13.16	9.109	+5 16 54.1	+57.41	+3 23.25	-0.745	16 1.26	1 4.52	0 45 49.34

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Semi-Pass Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Apr. 1	0 41 56.15	9.100	+ 4 30 47.4	+57.66	+3 59.26	-0.784	16 1.81	1 4.48	0 37 56.24
2	0 45 34.60	9.104	4 53 53.4	57.64	3 41.20	0.780	16 1.54	1 4.49	0 41 52.79
3	0 49 13.16	9.109	5 16 54.1	57.41	3 23.25	0.745	16 1.26	1 4.52	0 45 49.34
4	0 52 51.85	9.115	5 39 49.3	57.17	3 5.44	0.739	16 0.99	1 4.54	0 49 45.90
5	0 56 30.68	9.122	6 2 38.4	56.91	2 47.77	0.732	16 0.72	1 4.57	0 53 42.45
6	1 0 9.70	9.130	+ 6 25 21.3	+56.65	+2 30.29	-0.734	16 0.44	1 4.60	0 57 39.00
7	1 3 48.91	9.139	6 47 57.6	56.37	2 12.99	0.716	16 0.17	1 4.63	1 1 35.56
8	1 7 28.35	9.148	7 10 27.0	56.07	1 55.92	0.707	15 59.90	1 4.66	1 5 32.11
9	1 11 8.03	9.158	7 32 49.2	55.76	1 39.09	0.696	15 59.62	1 4.70	1 9 28.66
10	1 14 47.95	9.170	7 55 3.7	55.44	1 22.51	0.684	15 59.34	1 4.74	1 13 25.22
11	1 18 28.16	9.182	+ 8 17 10.5	+55.11	+1 6.22	-0.673	15 59.07	1 4.78	1 17 21.77
12	1 22 8.69	9.196	8 39 9.0	54.76	0 50.22	0.659	15 58.79	1 4.82	1 21 18.33
13	1 25 49.52	9.208	9 0 59.1	54.40	0 34.55	0.646	15 58.51	1 4.87	1 25 14.88
14	1 29 30.70	9.228	9 22 40.2	54.03	0 19.22	0.632	15 58.24	1 4.91	1 29 11.43
15	1 33 12.24	9.238	9 44 12.2	53.68	+0 4.23	0.617	15 57.96	1 4.96	1 33 7.99
16	1 36 54.14	9.254	+10 5 34.6	+53.28	-0 10.37	-0.601	15 57.69	1 5.01	1 37 4.54
17	1 40 36.43	9.271	10 26 47.1	52.81	0 24.60	0.584	15 57.42	1 5.07	1 41 1.10
18	1 44 19.13	9.288	10 47 49.4	52.37	0 38.42	0.567	15 57.15	1 5.13	1 44 57.65
19	1 48 2.23	9.305	11 8 41.0	51.92	0 51.84	0.550	15 56.89	1 5.18	1 48 54.20
20	1 51 45.74	9.322	11 29 21.6	51.46	1 4.83	0.532	15 56.63	1 5.24	1 52 50.76
21	1 55 29.69	9.340	+11 49 51.0	+50.98	-1 17.41	-0.515	15 56.37	1 5.31	1 56 47.31
22	1 59 14.07	9.359	12 10 8.7	50.48	1 29.54	0.496	15 56.11	1 5.37	2 0 43.87
23	2 2 58.91	9.378	12 30 14.3	49.98	1 41.24	0.478	15 55.86	1 5.44	2 4 40.42
24	2 6 44.20	9.397	12 50 7.6	49.45	1 52.47	0.459	15 55.61	1 5.51	2 8 36.98
25	2 10 29.95	9.416	13 9 48.1	48.91	2 3.25	0.440	15 55.36	1 5.58	2 12 33.53
26	2 14 16.16	9.435	+13 29 15.6	+48.37	-2 13.56	-0.420	15 55.12	1 5.65	2 16 30.09
27	2 18 2.86	9.455	13 48 29.7	47.80	2 23.39	0.400	15 54.88	1 5.72	2 20 26.64
28	2 21 50.04	9.476	14 7 30.2	47.22	2 32.73	0.379	15 54.64	1 5.80	2 24 23.19
29	2 25 37.73	9.497	14 26 16.5	46.63	2 41.58	0.359	15 54.40	1 5.88	2 28 19.75
30	2 29 25.92	9.518	14 44 48.6	46.03	2 49.93	0.337	15 54.16	1 5.95	2 32 16.30
May 1	2 33 14.62	9.540	+15 3 6.1	+45.42	-2 57.75	-0.315	15 53.93	1 6.03	2 36 12.86
2	2 37 3.84	9.563	15 21 8.6	44.79	3 5.06	0.293	15 53.70	1 6.11	2 40 9.41
3	2 40 53.60	9.585	15 38 56.0	44.15	3 11.84	0.271	15 53.46	1 6.19	2 44 5.97
4	2 44 43.89	9.607	15 56 27.8	43.50	3 18.09	0.249	15 53.24	1 6.27	2 48 2.53
5	2 48 34.73	9.630	16 13 43.7	42.83	3 23.79	0.226	15 53.01	1 6.35	2 51 59.08
6	2 52 26.13	9.653	+16 30 43.6	+42.15	-3 28.93	-0.203	15 52.78	1 6.43	2 55 55.64
7	2 56 18.10	9.677	16 47 27.0	41.46	3 33.51	0.179	15 52.56	1 6.51	2 59 52.19
8	3 0 10.63	9.701	17 3 53.8	40.76	3 37.53	0.155	15 52.34	1 6.59	3 3 48.75
9	3 4 3.73	9.725	17 20 3.5	40.05	3 40.96	0.131	15 52.11	1 6.68	3 7 45.30
10	3 7 57.43	9.749	17 35 56.0	39.32	3 43.82	0.107	15 51.90	1 6.76	3 11 41.86
11	3 11 51.72	9.774	+17 51 30.9	+38.58	-3 46.08	-0.082	15 51.68	1 6.84	3 15 38.41
12	3 15 46.59	9.799	18 6 48.0	37.83	3 47.75	0.057	15 51.47	1 6.92	3 19 34.97
13	3 19 42.07	9.824	18 21 46.9	37.07	3 48.83	0.033	15 51.26	1 7.00	3 23 31.53
14	3 23 38.14	9.848	18 36 27.3	36.29	3 49.31	-0.008	15 51.05	1 7.08	3 27 28.08
15	3 27 34.80	9.873	18 50 49.1	35.51	3 49.20	+0.017	15 50.84	1 7.16	3 31 24.64
16	3 31 32.07	9.898	+19 4 51.7	+34.71	-3 48.50	+0.041	15 50.64	1 7.24	3 35 21.20
17	3 35 29.92	9.922	+19 18 35.1	+33.89	-3 47.22	+0.065	15 50.44	1 7.32	3 39 17.75

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.	
	h m s	s	° ' "	"	m s	s	' "	m s	h m s	
May	17	3 35 29.92	9.922	+19 18 35.1	+33.89	-3 47.22	+0.065	15 50.44	1 7.32	3 39 17.75
	18	3 39 28.34	9.946	19 31 58.8	33.07	3 45.35	0.089	15 50.24	1 7.40	3 43 14.31
	19	3 43 27.33	9.970	19 45 2.7	32.24	3 42.92	0.113	15 50.05	1 7.48	3 47 10.86
	20	3 47 26.87	9.992	19 57 46.4	31.40	3 39.95	0.136	15 49.86	1 7.56	3 51 7.42
	21	3 51 26.97	10.015	20 10 9.7	30.54	3 36.41	0.159	15 49.68	1 7.63	3 55 3.98
	22	3 55 27.61	10.037	+20 22 12.3	+29.67	-3 32.35	+0.180	15 49.51	1 7.71	3 59 0.54
	23	3 59 28.76	10.068	20 33 53.8	28.79	3 27.76	0.201	15 49.34	1 7.78	4 2 57.09
	24	4 3 30.48	10.079	20 45 14.2	27.91	3 22.66	0.222	15 49.17	1 7.85	4 6 53.65
	25	4 7 32.60	10.100	20 56 13.2	27.01	3 17.06	0.243	15 49.01	1 7.92	4 10 50.21
	26	4 11 35.25	10.120	21 6 50.6	26.10	3 10.99	0.263	15 48.85	1 7.99	4 14 46.76
June	27	4 15 38.37	10.139	+21 17 6.1	+25.18	-3 4.44	+0.282	15 48.70	1 8.06	4 18 43.32
	28	4 19 41.95	10.159	21 26 59.6	24.26	2 57.43	0.301	15 48.55	1 8.13	4 22 39.88
	29	4 23 45.99	10.177	21 36 30.7	23.33	2 49.99	0.319	15 48.40	1 8.19	4 26 36.43
	30	4 27 50.45	10.195	21 45 39.3	22.39	2 42.11	0.337	15 48.26	1 8.25	4 30 32.99
	31	4 31 55.32	10.211	21 54 25.4	21.44	2 33.81	0.354	15 48.12	1 8.31	4 34 29.55
	1	4 36 0.59	10.227	+22 2 48.6	+20.48	-2 25.12	+0.370	15 47.98	1 8.37	4 38 26.11
	2	4 40 6.25	10.243	22 10 48.8	19.52	2 16.04	0.386	15 47.85	1 8.43	4 42 22.66
	3	4 44 12.29	10.259	22 18 25.8	18.55	2 6.58	0.401	15 47.72	1 8.48	4 46 19.22
	4	4 48 18.69	10.274	22 25 39.4	17.58	1 56.77	0.416	15 47.59	1 8.53	4 50 15.78
	5	4 52 25.43	10.288	22 32 29.5	16.60	1 46.62	0.430	15 47.47	1 8.58	4 54 12.34
	6	4 56 32.51	10.302	+22 38 56.0	+15.61	-1 36.12	+0.444	15 47.35	1 8.63	4 58 8.89
	7	5 0 39.90	10.315	22 44 58.8	14.63	1 25.31	0.457	15 47.23	1 8.67	5 2 5.45
	8	5 4 47.62	10.327	22 50 37.7	13.63	1 14.19	0.470	15 47.12	1 8.71	5 6 2.01
	9	5 8 55.61	10.338	22 55 52.6	12.61	1 2.78	0.481	15 47.01	1 8.75	5 9 58.57
	10	5 13 3.87	10.349	23 0 43.2	11.60	0 51.11	0.492	15 46.90	1 8.78	5 13 55.13
	11	5 17 12.40	10.360	+23 5 9.6	+10.59	-0 39.17	+0.502	15 46.79	1 8.81	5 17 51.68
	12	5 21 21.15	10.369	23 9 11.5	9.57	0 27.02	0.511	15 46.68	1 8.83	5 21 48.24
	13	5 25 30.11	10.377	23 12 49.1	8.55	0 14.64	0.519	15 46.59	1 8.86	5 25 44.80
	14	5 29 39.26	10.384	23 16 2.1	7.53	-0 2.09	0.526	15 46.49	1 8.88	5 29 41.36
	15	5 33 48.58	10.391	23 18 50.4	6.50	+0 10.62	0.532	15 46.40	1 8.90	5 33 37.92
	16	5 37 58.02	10.396	+23 21 14.0	+5.47	+0 23.48	+0.538	15 46.32	1 8.91	5 37 34.47
	17	5 42 7.58	10.400	23 23 12.9	4.44	0 36.45	0.542	15 46.25	1 8.92	5 41 31.03
	18	5 46 17.21	10.402	23 24 46.9	3.49	0 49.50	0.544	15 46.18	1 8.93	5 45 27.59
	19	5 50 26.90	10.404	23 25 56.2	2.37	1 2.59	0.546	15 46.11	1 8.94	5 49 24.15
	20	5 54 36.63	10.405	23 26 40.6	1.33	1 15.71	0.547	15 46.05	1 8.94	5 53 20.71
	21	5 58 46.34	10.404	+23 27 0.2	+0.30	+1 28.84	+0.546	15 45.99	1 8.94	5 57 17.26
	22	6 2 56.03	10.402	23 26 55.0	-0.73	1 41.93	0.544	15 45.94	1 8.94	6 1 13.82
	23	6 7 5.65	10.399	23 26 25.0	1.77	1 54.97	0.541	15 45.90	1 8.93	6 5 10.38
	24	6 11 15.20	10.395	23 25 30.2	2.80	2 7.91	0.537	15 45.86	1 8.92	6 9 6.94
	25	6 15 24.63	10.390	23 24 10.7	3.83	2 20.74	0.532	15 45.82	1 8.91	6 13 3.50
	26	6 19 33.93	10.385	+23 22 26.4	-4.86	+2 33.46	+0.527	15 45.79	1 8.89	6 17 0.05
	27	6 23 43.08	10.377	23 20 17.6	5.88	2 46.01	0.519	15 45.77	1 8.87	6 20 56.61
	28	6 27 52.04	10.369	23 17 44.1	6.90	2 58.38	0.511	15 45.75	1 8.85	6 24 53.17
	29	6 32 0.80	10.360	23 14 46.3	7.92	3 10.56	0.502	15 45.73	1 8.81	6 28 49.73
30	6 36 9.33	10.350	23 11 23.9	8.94	3 22.50	0.493	15 45.72	1 8.78	6 32 46.28	
July	1	6 40 17.62	10.340	+23 7 37.2	-9.95	+3 34.19	+0.482	15 45.71	1 8.75	6 36 42.84
	2	6 44 25.64	10.328	+23 3 26.5	-10.95	+3 45.63	+0.470	15 45.71	1 8.71	6 40 39.40

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
July	1 6 40 17.62	10.340	+23 7 37.2	-9.95	+3 34.19	+0.482	15 45.71	1 8.75	6 36 42.84
	2 6 44 25.64	10.328	23 3 26.5	10.95	3 45.63	0.470	15 45.71	1 8.71	6 40 39.40
	3 6 48 33.38	10.316	22 58 51.5	11.95	3 56.76	0.458	15 45.70	1 8.67	6 44 35.96
	4 6 52 40.80	10.303	22 53 52.5	12.95	4 7.61	0.445	15 45.70	1 8.63	6 48 32.52
	5 6 56 47.93	10.290	22 48 29.6	13.95	4 18.15	0.432	15 45.71	1 8.59	6 52 29.07
	6 7 0 54.71	10.276	+22 42 42.9	-14.93	+4 28.34	+0.418	15 45.71	1 8.54	6 56 25.63
	7 7 5 1.15	10.261	22 36 32.7	15.92	4 38.20	0.408	15 45.72	1 8.49	7 0 22.19
	8 7 9 7.24	10.246	22 29 58.7	16.90	4 47.70	0.399	15 45.74	1 8.44	7 4 18.75
	9 7 13 12.96	10.230	22 23 1.5	17.87	4 56.84	0.372	15 45.75	1 8.38	7 8 15.39
	10 7 17 18.28	10.213	22 15 41.0	18.84	5 5.58	0.355	15 45.78	1 8.32	7 12 11.86
	11 7 21 23.21	10.196	+22 7 57.3	-19.79	+5 13.92	+0.338	15 45.81	1 8.26	7 16 8.42
	12 7 25 27.70	10.178	21 59 50.9	20.74	5 21.85	0.321	15 45.84	1 8.20	7 20 4.97
	13 7 29 31.78	10.160	21 51 21.6	21.69	5 29.32	0.302	15 45.87	1 8.14	7 24 1.53
	14 7 33 35.37	10.141	21 42 29.9	22.62	5 36.35	0.283	15 45.91	1 8.07	7 27 58.09
	15 7 37 38.51	10.121	21 33 15.9	23.55	5 42.93	0.264	15 45.95	1 8.00	7 31 54.65
	16 7 41 41.16	10.100	+21 23 39.8	-24.46	+5 49.00	+0.243	15 46.00	1 7.92	7 35 51.21
	17 7 45 43.30	10.078	21 13 41.8	25.36	5 54.57	0.221	15 46.05	1 7.85	7 39 47.76
	18 7 49 44.92	10.056	21 3 22.1	26.26	5 59.62	0.199	15 46.12	1 7.77	7 43 44.32
	19 7 53 46.01	10.034	20 52 41.2	27.15	6 4.14	0.177	15 46.18	1 7.70	7 47 40.88
	20 7 57 46.53	10.011	20 41 39.1	28.02	6 8.10	0.154	15 46.26	1 7.62	7 51 37.43
	21 8 1 46.51	9.987	+20 30 16.1	-28.88	+6 11.51	+0.130	15 46.34	1 7.54	7 55 33.99
	22 8 5 45.92	9.963	20 18 32.5	29.74	6 14.35	0.106	15 46.42	1 7.46	7 59 30.55
	23 8 9 44.73	9.939	20 6 28.4	30.59	6 16.60	0.082	15 46.51	1 7.38	8 3 27.10
	24 8 13 42.96	9.914	19 54 4.3	31.42	6 18.26	0.057	15 46.60	1 7.29	8 7 23.66
	25 8 17 40.59	9.888	19 41 20.4	32.23	6 19.32	0.032	15 46.70	1 7.21	8 11 20.22
	26 8 21 37.60	9.862	+19 28 16.9	-33.04	+6 19.79	+0.006	15 46.80	1 7.13	8 15 16.77
	27 8 25 34.00	9.837	19 14 54.2	33.84	6 19.63	-0.020	15 46.90	1 7.04	8 19 13.33
	28 8 29 29.78	9.811	19 1 12.4	34.68	6 18.86	0.045	15 47.02	1 6.96	8 23 9.89
	29 8 33 24.95	9.785	18 47 11.9	35.40	6 17.47	0.071	15 47.13	1 6.87	8 27 6.44
	30 8 37 19.48	9.759	18 32 53.0	36.16	6 15.46	0.097	15 47.25	1 6.79	8 31 3.00
Aug.	31 8 41 13.40	9.733	+18 18 15.9	-36.92	+6 12.82	-0.123	15 47.37	1 6.70	8 34 59.56
	1 8 45 6.70	9.708	18 3 20.8	37.66	6 9.57	0.148	15 47.50	1 6.61	8 38 56.11
	2 8 48 59.38	9.683	17 48 8.1	38.39	6 5.71	0.173	15 47.62	1 6.53	8 42 52.67
	3 8 52 51.46	9.658	17 32 38.0	39.11	6 1.24	0.198	15 47.75	1 6.44	8 46 49.22
	4 8 56 42.93	9.633	17 16 50.8	39.82	5 56.17	0.223	15 47.88	1 6.35	8 50 45.78
	5 9 0 33.80	9.608	+17 0 46.9	-40.51	+5 50.51	-0.248	15 48.02	1 6.27	8 54 42.34
	6 9 4 24.10	9.584	16 44 26.2	41.20	5 44.26	0.272	15 48.15	1 6.18	8 58 38.89
	7 9 8 13.80	9.559	16 27 49.2	41.87	5 37.44	0.296	15 48.29	1 6.09	9 2 35.45
	8 9 12 2.94	9.536	16 10 56.2	42.54	5 30.04	0.320	15 48.44	1 6.01	9 6 32.00
	9 9 15 51.51	9.512	15 53 47.5	43.18	5 22.08	0.343	15 48.58	1 5.92	9 10 28.56
	10 9 19 39.53	9.489	+15 36 23.4	-43.81	+5 13.56	-0.367	15 48.73	1 5.84	9 14 25.11
	11 9 23 26.98	9.466	15 18 44.2	44.44	5 4.48	0.390	15 48.88	1 5.76	9 18 21.67
	12 9 27 13.89	9.443	15 0 50.2	45.05	4 54.85	0.413	15 49.04	1 5.67	9 22 18.22
	13 9 31 0.24	9.420	14 42 41.6	45.65	4 44.69	0.435	15 49.21	1 5.59	9 26 14.78
	14 9 34 46.06	9.398	14 24 19.0	46.23	4 33.98	0.457	15 49.38	1 5.51	9 30 11.33
	15 9 38 31.35	9.376	+14 5 42.6	-46.80	+4 22.74	-0.479	15 49.55	1 5.44	9 34 7.89
	16 9 42 16.10	9.354	+13 46 52.6	-47.36	+4 10.98	-0.501	15 49.72	1 5.36	9 38 4.44

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Aug. 16	9 42 16.10	9.354	+13 46 52.6	-47.36	+ 4 10.98	-0.501	15 49.72	1 5.36	9 38 4.44
17	9 46 0.34	9.333	13 27 49.5	47.89	3 58.69	0.522	15 49.90	1 5.29	9 42 1.00
18	9 49 44.07	9.312	13 8 33.7	48.42	3 45.90	0.543	15 50.09	1 5.21	9 45 57.55
19	9 53 27.29	9.291	12 49 5.4	48.94	3 32.60	0.564	15 50.28	1 5.14	9 49 54.11
20	9 57 10.02	9.271	12 29 24.8	49.43	3 18.82	0.584	15 50.47	1 5.07	9 53 50.66
21	10 0 52.26	9.250	+12 9 32.5	-49.91	+ 3 4.55	-0.604	15 50.67	1 5.00	9 57 47.22
22	10 4 34.03	9.231	11 49 28.8	50.39	2 49.79	0.624	15 50.87	1 4.94	10 1 43.77
23	10 8 15.32	9.211	11 29 13.8	50.85	2 34.58	0.643	15 51.08	1 4.87	10 5 40.32
24	10 11 56.17	9.193	11 8 48.1	51.29	2 18.91	0.662	15 51.29	1 4.81	10 9 36.88
25	10 15 36.58	9.175	10 48 11.9	51.72	2 2.81	0.680	15 51.50	1 4.74	10 13 33.43
26	10 19 16.56	9.157	+10 27 25.6	-52.14	+ 1 46.27	-0.698	15 51.72	1 4.68	10 17 29.99
27	10 22 56.12	9.140	10 6 29.4	52.54	1 29.34	0.714	15 51.94	1 4.63	10 21 26.54
28	10 26 35.28	9.124	9 45 23.7	52.98	1 11.99	0.730	15 52.16	1 4.57	10 25 23.09
29	10 30 14.06	9.109	9 24 8.7	53.31	0 54.27	0.746	15 52.39	1 4.52	10 29 19.65
30	10 33 52.49	9.094	9 2 44.9	53.67	0 36.19	0.760	15 52.61	1 4.47	10 33 16.20
31	10 37 30.57	9.080	+ 8 41 12.4	-54.02	+ 0 17.77	-0.774	15 52.84	1 4.42	10 37 12.76
Sept. 1	10 41 8.33	9.067	8 19 31.6	54.37	- 0 0.98	0.788	15 53.06	1 4.37	10 41 9.31
2	10 44 45.79	9.055	7 57 42.8	54.70	0 20.02	0.799	15 53.29	1 4.33	10 45 5.86
3	10 48 22.97	9.044	7 35 46.1	55.02	0 39.34	0.810	15 53.52	1 4.29	10 49 2.42
4	10 51 59.90	9.034	7 13 41.9	55.32	0 58.91	0.820	15 53.75	1 4.25	10 52 58.97
5	10 55 36.59	9.024	+ 6 51 30.6	-55.61	- 1 18.72	-0.830	15 53.99	1 4.22	10 56 55.52
6	10 59 13.07	9.016	6 29 12.5	55.89	1 38.73	0.838	15 54.22	1 4.18	11 0 52.08
7	11 2 49.37	9.009	6 6 47.8	56.16	1 58.94	0.845	15 54.46	1 4.15	11 4 48.63
8	11 6 25.47	9.002	5 44 16.9	56.41	2 19.33	0.852	15 54.69	1 4.13	11 8 45.18
9	11 10 1.42	8.995	5 21 40.2	56.65	2 39.88	0.859	15 54.93	1 4.10	11 12 41.73
10	11 13 37.23	8.990	+ 4 58 58.0	-56.87	- 3 0.56	-0.864	15 55.18	1 4.08	11 16 38.29
11	11 17 12.94	8.985	4 36 10.4	57.08	3 21.35	0.869	15 55.42	1 4.06	11 20 34.84
12	11 20 48.53	8.981	4 13 18.0	57.28	3 42.26	0.873	15 55.67	1 4.05	11 24 31.39
13	11 24 24.02	8.978	3 50 21.2	57.46	4 3.26	0.876	15 55.92	1 4.03	11 28 27.95
14	11 27 59.46	8.976	3 27 20.2	57.62	4 24.32	0.878	15 56.18	1 4.02	11 32 24.50
15	11 31 34.84	8.974	+ 3 4 15.5	-57.77	- 4 45.44	-0.880	15 56.43	1 4.01	11 36 21.05
16	11 35 10.17	8.972	2 41 7.2	57.91	5 6.60	0.882	15 56.69	1 4.01	11 40 17.61
17	11 38 45.50	8.972	2 17 55.9	58.02	5 27.77	0.882	15 56.96	1 4.01	11 44 14.16
18	11 42 20.82	8.972	1 54 41.8	58.13	5 48.94	0.882	15 57.22	1 4.01	11 48 10.71
19	11 45 56.15	8.973	1 31 25.3	58.23	6 10.11	0.881	15 57.49	1 4.01	11 52 7.26
20	11 49 31.52	8.974	+ 1 8 6.8	-58.30	- 6 31.23	-0.880	15 57.76	1 4.02	11 56 3.82
21	11 53 6.93	8.977	0 44 46.6	58.37	6 52.31	0.877	15 58.03	1 4.03	12 0 0.37
22	11 56 42.42	8.981	+ 0 21 25.1	58.42	7 13.32	0.873	15 58.30	1 4.04	12 3 56.92
23	12 0 18.00	8.985	- 0 1 57.3	58.45	7 34.24	0.869	15 58.58	1 4.06	12 7 53.48
24	12 3 53.67	8.989	0 25 20.5	58.47	7 55.06	0.865	15 58.86	1 4.08	12 11 50.03
25	12 7 29.48	8.995	- 0 48 44.0	-58.48	- 8 15.75	-0.859	15 59.13	1 4.11	12 15 46.58
26	12 11 5.42	9.001	1 12 7.4	58.47	8 36.29	0.863	15 59.41	1 4.14	12 19 43.14
27	12 14 41.54	9.009	1 35 30.4	58.44	8 56.68	0.845	15 59.69	1 4.17	12 23 39.69
28	12 18 17.86	9.018	1 58 52.7	58.41	9 16.87	0.837	15 59.97	1 4.20	12 27 36.24
29	12 21 54.38	9.027	2 22 14.0	58.36	9 36.84	0.827	16 0.24	1 4.23	12 31 32.79
30	12 25 31.14	9.037	- 2 45 34.0	-58.30	- 9 56.57	-0.817	16 0.52	1 4.27	12 35 29.35
Oct. 1	12 29 8.16	9.049	- 3 8 52.5	-58.22	-10 16.05	-0.803	16 0.80	1 4.31	12 39 25.90

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ' "	"	m s	s	' "	m s	h m s
Oct.	1	12 29 8.16	9.049	— 3 8 52.5	—58.22	—10 16.05	—0.865	16 0.80	1 4.31	12 39 25.90
	2	12 32 45.49	9.062	3 32 9.0	58.14	10 35.22	0.792	16 1.07	1 4.35	12 43 22.45
	3	12 36 23.12	9.075	3 55 23.1	58.08	10 54.09	0.779	16 1.35	1 4.40	12 47 19.00
	4	12 40 1.10	9.089	4 18 34.6	57.91	11 12.62	0.765	16 1.62	1 4.45	12 51 15.56
	5	12 43 39.43	9.105	4 41 43.2	57.78	11 30.79	0.749	16 1.89	1 4.50	12 55 12.11
	6	12 47 18.16	9.122	— 5 4 48.3	—57.64	—11 48.56	—0.733	16 2.16	1 4.56	12 59 8.66
	7	12 50 57.28	9.139	5 27 49.9	57.48	12 5.95	0.715	16 2.43	1 4.62	13 3 5.22
	8	12 54 36.84	9.157	5 50 47.4	57.30	12 22.90	0.697	16 2.70	1 4.68	13 7 1.77
	9	12 58 16.83	9.176	6 13 40.4	57.11	12 39.41	0.678	16 2.98	1 4.74	13 10 58.32
	10	13 1 57.80	9.194	6 36 28.5	56.89	12 55.46	0.659	16 3.25	1 4.81	13 14 54.88
	11	13 5 38.24	9.216	— 6 59 11.5	—56.67	—13 11.02	—0.639	16 3.52	1 4.88	13 18 51.43
	12	13 9 19.68	9.238	7 21 49.0	56.48	13 26.10	0.617	16 3.79	1 4.95	13 22 47.98
	13	13 13 1.63	9.260	7 44 20.3	56.17	13 40.65	0.595	16 4.06	1 5.03	13 26 44.54
	14	13 16 44.12	9.282	8 6 45.2	55.90	13 54.69	0.573	16 4.34	1 5.11	13 30 41.09
	15	13 20 27.16	9.306	8 29 8.5	55.61	14 8.17	0.550	16 4.61	1 5.19	13 34 37.64
	16	13 24 10.75	9.328	— 8 51 14.5	—55.30	—14 21.08	—0.528	16 4.88	1 5.27	13 38 34.20
	17	13 27 54.92	9.352	9 13 17.9	54.98	14 33.43	0.502	16 5.16	1 5.36	13 42 30.75
	18	13 31 39.69	9.378	9 35 13.4	54.64	14 45.20	0.478	16 5.43	1 5.44	13 46 27.30
	19	13 35 25.05	9.404	9 57 0.5	54.28	14 56.36	0.452	16 5.71	1 5.53	13 50 23.86
	20	13 39 11.03	9.430	10 18 38.7	53.90	15 6.90	0.426	16 5.98	1 5.62	13 54 20.41
	21	13 42 57.65	9.456	—10 40 7.8	—53.51	—15 16.81	—0.399	16 6.26	1 5.72	13 58 16.96
	22	13 46 44.91	9.482	11 1 27.3	53.10	15 26.08	0.373	16 6.53	1 5.82	14 2 13.52
	23	13 50 32.80	9.510	11 22 36.7	52.68	15 34.70	0.345	16 6.81	1 5.92	14 6 10.07
	24	13 54 21.39	9.538	11 43 35.8	52.28	15 42.65	0.317	16 7.08	1 6.02	14 10 6.63
	25	13 58 10.66	9.567	12 4 24.1	51.78	15 49.92	0.289	16 7.35	1 6.12	14 14 3.18
	26	14 2 0.62	9.596	—12 25 1.3	—51.31	—15 56.50	—0.259	16 7.62	1 6.23	14 17 59.74
	27	14 5 51.30	9.627	12 45 27.0	50.82	16 2.35	0.229	16 7.88	1 6.33	14 21 56.29
	28	14 9 42.72	9.658	13 5 40.7	50.31	16 7.48	0.198	16 8.15	1 6.44	14 25 52.84
	29	14 13 34.88	9.690	13 25 42.1	49.80	16 11.85	0.166	16 8.40	1 6.55	14 29 49.40
	30	14 17 27.81	9.722	13 45 30.9	49.26	16 15.47	0.134	16 8.66	1 6.66	14 33 45.95
	31	14 21 21.52	9.755	—14 5 6.7	—48.71	—16 18.31	—0.102	16 8.91	1 6.77	14 37 42.51
Nov.	1	14 25 16.08	9.788	14 24 28.9	48.14	16 20.34	0.068	16 9.16	1 6.89	14 41 39.06
	2	14 29 11.35	9.822	14 43 37.4	47.55	16 21.59	0.035	16 9.40	1 7.00	14 45 35.62
	3	14 33 7.48	9.856	15 2 31.5	46.95	16 22.01	—0.001	16 9.64	1 7.12	14 49 32.17
	4	14 37 4.45	9.891	15 21 11.1	46.34	16 21.59	+0.034	16 9.88	1 7.24	14 53 28.73
	5	14 41 2.26	9.926	—15 39 35.7	—45.70	—16 20.34	+0.070	16 10.12	1 7.36	14 57 25.28
	6	14 45 0.92	9.962	15 57 44.7	45.04	16 18.24	0.105	16 10.35	1 7.47	15 1 21.84
	7	14 49 0.44	9.998	16 15 37.9	44.37	16 15.29	0.141	16 10.59	1 7.59	15 5 18.39
	8	14 53 0.81	10.034	16 33 14.8	43.69	16 11.47	0.177	16 10.82	1 7.71	15 9 14.95
	9	14 57 2.06	10.070	16 50 34.9	42.99	16 6.81	0.213	16 11.04	1 7.83	15 13 11.51
	10	15 1 4.16	10.106	—17 7 37.9	—42.25	—16 1.27	+0.249	16 11.27	1 7.95	15 17 8.06
	11	15 5 7.13	10.142	17 24 23.4	41.52	15 54.88	0.285	16 11.49	1 8.07	15 21 4.62
	12	15 9 10.95	10.178	17 40 51.0	40.77	15 47.62	0.320	16 11.71	1 8.19	15 25 1.17
	13	15 13 15.65	10.213	17 57 0.1	39.99	15 39.51	0.356	16 11.93	1 8.31	15 28 57.73
	14	15 17 21.20	10.249	18 12 50.4	39.20	15 30.54	0.391	16 12.14	1 8.42	15 32 54.29
	15	15 21 27.60	10.284	—18 28 21.6	—38.39	—15 20.72	+0.426	16 12.36	1 8.54	15 36 50.84
	16	15 25 34.85	10.319	—18 43 33.3	—37.57	—15 10.06	+0.461	16 12.57	1 8.66	15 40 47.40

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time. Mean—App.		Var. per Hour.	Semi-diameter.		S. T. of Sem. Pass. Merid.		Sidereal Time of Mean Noon.		
	h	m	s		°	'	"		m	s		'	"	m	s	h	m	s
Nov. 16	15	25	34.85	10.319	-18	43	33.3	-37.57	-15	10.06	+0.461	16	12.57	1	8.66	15	40	47.40
17	15	29	42.91	10.363	18	58	24.9	36.73	14	58.57	0.496	16	12.78	1	8.78	15	44	43.95
18	15	33	51.83	10.388	19	12	56.1	35.87	14	46.25	0.530	16	12.99	1	8.89	15	48	40.51
19	15	38	1.56	10.422	19	27	6.6	35.00	14	33.12	0.564	16	13.20	1	9.00	15	52	37.07
20	15	42	12.08	10.455	19	40	56.0	34.11	14	19.19	0.597	16	13.40	1	9.12	15	56	33.62
21	15	46	23.40	10.488	-19	54	23.9	-33.21	-14	4.47	+0.630	16	13.60	1	9.23	16	0	30.18
22	15	50	35.51	10.521	20	7	29.9	32.39	18	48.96	0.662	16	13.80	1	9.34	16	4	26.74
23	15	54	48.39	10.553	20	20	13.7	31.36	18	32.68	0.694	16	14.00	1	9.45	16	8	23.29
24	15	59	2.03	10.585	20	32	35.1	30.41	18	15.65	0.726	16	14.18	1	9.56	16	12	19.85
25	16	3	16.42	10.615	20	44	33.5	29.45	12	57.86	0.757	16	14.37	1	9.66	16	16	16.41
26	16	7	31.56	10.646	-20	56	8.6	-28.48	-12	39.33	+0.787	16	14.55	1	9.76	16	20	12.97
27	16	11	47.42	10.676	21	7	20.3	27.49	12	20.07	0.817	16	14.73	1	9.86	16	24	9.52
28	16	16	4.00	10.705	21	18	8.3	26.49	12	0.09	0.847	16	14.89	1	9.96	16	28	6.08
29	16	20	21.30	10.735	21	28	32.1	25.48	11	39.41	0.876	16	15.06	1	10.06	16	32	2.64
30	16	24	39.28	10.763	21	38	31.4	24.46	11	18.06	0.904	16	15.21	1	10.15	16	35	59.19
Dec. 1	16	28	57.95	10.791	-21	48	6.0	-23.42	-10	56.00	+0.932	16	15.37	1	10.24	16	39	55.75
2	16	33	17.27	10.819	21	57	15.5	22.37	10	33.31	0.969	16	15.52	1	10.33	16	43	52.31
3	16	37	37.23	10.845	22	5	59.7	21.31	10	9.97	0.985	16	15.66	1	10.41	16	47	48.87
4	16	41	57.82	10.870	22	14	18.3	20.34	9	46.01	1.010	16	15.80	1	10.49	16	51	45.43
5	16	46	18.99	10.894	22	22	11.1	19.16	9	21.46	1.035	16	15.93	1	10.57	16	55	41.98
6	16	50	40.75	10.918	-22	29	37.8	-18.06	-8	56.33	+1.058	16	16.06	1	10.64	16	59	38.54
7	16	55	3.04	10.940	22	36	38.2	16.96	8	30.66	1.080	16	16.18	1	10.70	17	3	35.10
8	16	59	25.86	10.961	22	43	11.8	15.85	8	4.46	1.101	16	16.30	1	10.77	17	7	31.66
9	17	3	49.18	10.981	22	49	18.8	14.73	7	37.78	1.121	16	16.41	1	10.83	17	11	28.22
10	17	8	12.95	11.000	22	54	53.8	13.60	7	10.64	1.140	16	16.52	1	10.89	17	15	24.77
11	17	12	37.16	11.016	-23	0	11.5	-12.46	-6	43.07	+1.157	16	16.63	1	10.95	17	19	21.33
12	17	17	1.75	11.032	23	4	56.9	11.31	6	15.10	1.173	16	16.73	1	11.00	17	23	17.89
13	17	21	26.72	11.047	23	9	14.8	10.16	5	46.78	1.187	16	16.84	1	11.04	17	27	14.45
14	17	25	52.00	11.060	23	13	5.0	9.01	5	18.12	1.200	16	16.93	1	11.08	17	31	11.01
15	17	30	17.58	11.071	23	16	27.3	7.85	4	49.18	1.211	16	17.03	1	11.12	17	35	7.56
16	17	34	43.42	11.081	-23	19	21.7	-6.69	-4	19.99	+1.221	16	17.12	1	11.16	17	39	4.12
17	17	39	9.46	11.088	23	21	48.2	5.52	3	50.59	1.228	16	17.20	1	11.18	17	43	0.68
18	17	43	35.68	11.095	23	23	46.6	4.35	3	21.00	1.235	16	17.29	1	11.20	17	46	57.24
19	17	48	2.03	11.100	23	25	16.7	3.17	2	51.29	1.240	16	17.36	1	11.22	17	50	53.80
20	17	52	28.49	11.104	23	26	18.7	2.00	2	21.47	1.244	16	17.43	1	11.24	17	54	50.36
21	17	56	55.03	11.108	-23	26	52.4	-0.82	-1	51.58	+1.246	16	17.50	1	11.25	17	58	46.91
22	18	1	21.58	11.108	23	26	57.9	+0.36	1	21.67	1.246	16	17.57	1	11.25	18	2	43.47
23	18	5	48.14	11.108	23	26	35.1	1.54	0	51.75	1.246	16	17.63	1	11.25	18	6	40.03
24	18	10	14.67	11.108	23	25	44.1	2.71	-0	21.86	1.243	16	17.68	1	11.25	18	10	36.59
25	18	14	41.12	11.100	23	24	24.8	3.89	+0	7.96	1.240	16	17.73	1	11.24	18	14	33.15
26	18	19	7.49	11.096	-23	22	37.4	+5.06	+0	37.68	+1.236	16	17.77	1	11.23	18	18	29.71
27	18	23	33.73	11.090	23	20	21.8	6.24	1	7.28	1.230	16	17.81	1	11.21	18	22	26.26
28	18	27	59.82	11.083	23	17	38.0	7.41	1	36.73	1.223	16	17.83	1	11.19	18	26	22.82
29	18	32	25.72	11.075	23	14	26.2	8.57	2	6.00	1.215	16	17.85	1	11.16	18	30	19.38
30	18	36	51.41	11.066	23	10	46.4	9.74	2	35.05	1.206	16	17.87	1	11.13	18	34	15.94
31	18	41	16.86	11.055	-23	6	38.8	+10.90	+3	3.87	+1.195	16	17.88	1	11.09	18	38	12.50

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.19 from the sidereal interval.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Ver. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meri- dian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Jan. 1	U	6 57.69	2.019	1 41 56.25	131.34	+16 9 51.5	+698.7	66.95	15 30.6	56 49.4	I. S.
1	L	19 22.09	2.048	2 8 22.44	133.07	18 22 30.9	636.5	67.37	15 24.9	56 28.7	
2	U	7 46.85	2.079	2 35 10.38	134.95	20 19 59.8	547.0	67.84	15 19.7	56 9.4	I. S.
2	L	20 11.98	2.110	3 2 20.81	136.78	22 0 54.1	460.9	68.28	15 14.8	55 51.5	
3	U	8 37.47	2.137	3 29 52.32	138.42	+23 23 59.3	+369.1	68.67	15 10.3	55 35.1	I. S.
3	L	21 3.24	2.158	3 57 41.33	139.67	24 28 13.5	272.6	68.95	15 6.2	55 20.0	
4	U	9 29.21	2.169	4 25 42.14	140.37	25 12 49.7	173.0	69.09	15 2.5	55 6.2	I. N.S.
4	L	21 55.26	2.170	4 53 47.52	140.42	25 37 20.5	+ 72.0	69.07	14 59.1	54 53.9	
5	U	10 21.24	2.159	5 21 49.15	139.74	+25 41 39.9	- 28.5	68.87	14 56.1	54 42.7	I. N.S.
5	L	22 47.02	2.136	5 49 38.38	138.35	25 26 4.4	126.9	68.49	14 53.4	54 32.9	
6	U	11 12.46	2.102	6 17 7.00	136.32	24 51 12.3	221.0	67.94	14 51.0	54 24.2	I. N.S.
6	L	23 37.43	2.080	6 44 7.99	133.77	23 58 1.6	309.8	67.27	14 49.0	54 16.8	
7	U	12 1.86	2.011	7 10 35.89	130.84	+22 47 45.4	-391.8	66.50	14 47.3	54 10.5	I. // N.S.
8	L	0 25.68	1.969	7 36 27.23	127.69	21 21 49.2	466.4	65.67	14 45.9	54 5.5	
8	U	12 48.87	1.906	8 1 40.47	124.52	19 41 45.0	533.0	64.82	14 44.9	54 1.8	II. S.
9	L	1 11.42	1.855	8 26 15.98	121.43	17 49 8.1	591.8	64.00	14 44.2	53 59.4	
9	U	13 33.39	1.807	8 50 15.79	118.58	+15 45 33.4	-642.7	63.25	14 44.0	53 58.4	II. S.
10	L	1 54.82	1.765	9 13 43.32	116.07	13 32 33.7	686.1	62.58	14 44.1	53 59.0	
10	U	14 15.79	1.730	9 36 43.17	113.97	11 11 37.5	722.1	62.03	14 44.7	54 1.2	II. S.
11	L	2 36.39	1.704	9 59 20.80	112.38	8 44 9.5	751.4	61.61	14 45.8	54 5.2	
11	U	14 56.72	1.686	10 21 42.44	111.32	+ 6 11 29.6	-774.1	61.34	14 47.4	54 11.0	II. S.
12	L	3 16.90	1.679	10 43 54.89	110.85	3 34 54.2	790.7	61.24	14 49.6	54 18.9	
12	U	15 37.05	1.681	11 6 5.41	111.01	+ 0 55 37.9	801.0	61.32	14 52.3	54 28.9	II. S.
13	L	3 57.30	1.695	11 28 21.75	111.82	- 1 45 5.7	805.2	61.59	14 55.6	54 41.1	
13	U	16 17.77	1.720	11 50 51.99	113.34	- 4 26 0.7	-802.9	62.05	14 59.6	54 55.7	II. S.
14	L	4 38.62	1.757	12 13 44.59	115.56	7 5 48.3	793.7	62.69	15 4.2	55 12.5	
14	U	16 59.99	1.806	12 37 8.35	118.52	9 43 2.0	777.1	63.53	15 9.4	55 31.8	II. S.
15	L	5 22.02	1.868	13 1 12.14	122.24	12 16 5.7	751.9	64.56	15 15.3	55 53.3	
15	U	17 44.87	1.942	13 26 4.89	126.68	-14 43 10.4	-717.0	65.77	15 21.7	56 17.0	II. S.
16	L	6 8.67	2.027	13 51 55.16	131.81	17 2 11.2	671.1	67.13	15 28.8	56 42.8	
16	U	18 33.55	2.122	14 18 50.62	137.53	19 10 46.3	612.4	68.61	15 36.3	57 10.4	II. S.
17	L	6 59.62	2.224	14 46 57.38	143.65	21 6 14.5	539.7	70.16	15 44.2	57 39.4	
17	U	19 26.94	2.329	15 16 19.03	149.96	-22 45 38.5	-451.6	71.72	15 52.4	58 9.4	II. S.
18	L	7 55.50	2.430	15 46 55.61	156.08	24 5 49.8	347.6	73.20	16 0.7	58 39.8	
18	U	20 25.23	2.522	16 18 42.53	161.61	25 3 38.7	228.0	74.50	16 8.9	59 9.9	II. S.
19	L	8 55.96	2.597	16 51 30.05	166.11	25 36 8.6	- 94.9	75.53	16 16.8	59 39.0	
19	U	21 27.46	2.648	17 25 3.23	169.16	-25 40 55.0	+ 48.5	76.23	16 24.2	60 6.2	II. S.
20	L	9 59.40	2.670	17 59 3.07	170.52	25 16 22.6	197.2	76.51	16 30.8	60 30.6	
20	U	22 31.43	2.663	18 33 8.41	170.09	24 22 2.1	345.6	76.37	16 36.5	60 51.5	II. N.
21	L	11 3.20	2.629	19 6 58.57	168.02	22 58 36.4	487.1	75.87	16 41.0	61 8.0	
21	U	23 34.43	2.573	19 40 15.68	164.64	-21 7 59.5	+616.5	75.06	16 44.2	61 19.5	
22	L	12 4.89	2.502	20 12 46.50	160.39	18 53 5.3	729.4	74.03	16 45.8	61 25.6	
23	U	0 34.45	2.424	20 44 23.10	155.69	16 17 31.4	822.8	72.89	16 46.0	61 26.1	
23	L	13 3.06	2.345	21 15 2.69	160.94	13 25 21.3	895.3	71.74	16 44.6	61 20.9	
24	U	1 30.75	2.271	21 44 46.80	146.46	-10 20 47.6	+946.8	70.64	16 41.7	61 10.4	I. S.

Jan. 4, U Defective Illumination of N. 0°.53.
Jan. 5, U Defective Illumination of S. 0°.02.

Jan. 6, U Defective Illumination of S. 0°.24.
Jan. 7, U Defective Illumination of II. 0°.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
Jan. 24	U	h m	m	h m s	s	" "	"	s	" "	" "	I. S.
		1 30.75	2.371	21 44 46.80	146.40	-10 20 47.6	+046.8	70.64	16 41.7	61 10.4	I. S.
24	L	13 57.59	2.306	22 13 40.22	143.53	7 7 58.6	978.0	69.67	16 37.5	60 55.1	I. S.
25	U	2 23.71	2.150	22 41 49.93	139.23	3 50 49.8	990.4	68.86	16 32.2	60 35.5	I. S.
25	L	14 49.24	2.107	23 9 24.20	136.63	- 0 32 56.7	985.7	68.22	16 25.9	60 12.3	I. S.
26	U	3 14.33	2.076	23 36 31.78	134.77	+ 2 42 25.9	+065.7	67.77	16 18.8	59 46.4	I. S.
26	L	15 39.12	2.067	0 3 21.47	133.63	5 52 25.0	982.0	67.50	16 11.2	59 18.6	I. S.
27	U	4 3.75	2.049	0 30 1.58	133.16	8 54 28.0	986.6	67.41	16 3.4	58 49.7	I. S.
27	L	16 28.34	2.061	0 56 39.67	133.28	11 46 20.5	830.6	67.47	15 55.4	58 20.4	I. S.
28	U	4 53.01	2.061	1 23 22.23	133.89	+14 26 4.3	+765.3	67.65	15 47.5	57 51.4	I. S.
28	L	17 17.84	2.078	1 50 14.47	134.87	16 51 54.6	691.8	67.92	15 39.8	57 23.1	I. S.
29	U	5 42.90	2.098	2 17 20.04	136.08	19 2 18.7	611.1	68.24	15 32.4	56 56.0	I. S.
29	L	18 8.20	2.119	2 44 40.80	137.37	20 55 55.9	524.0	68.57	15 25.4	56 30.4	I. S.
30	U	6 33.76	2.140	3 12 16.70	138.59	+22 31 36.8	+431.9	68.87	15 18.9	56 6.7	I. S.
30	L	18 59.54	2.158	3 40 5.82	139.55	23 48 25.2	335.5	69.11	15 13.0	55 44.9	I. S.
31	U	7 25.47	2.165	4 8 4.30	140.12	24 45 39.2	236.4	69.23	15 7.7	55 25.3	I. S.
31	L	19 51.47	2.166	4 36 6.68	140.18	25 22 53.2	135.8	69.22	15 2.9	55 7.7	I. S.
Feb. 1	U	8 17.42	2.158	5 4 6.38	139.67	+25 39 59.4	+ 35.4	69.04	14 58.6	54 52.3	I. S.
1	L	20 43.21	2.139	5 31 56.21	138.55	25 37 8.7	- 63.4	68.71	14 55.0	54 39.0	I. N.S.
2	U	9 8.71	2.110	5 59 29.01	136.84	25 14 50.1	189.0	68.24	14 52.0	54 27.8	I. N.S.
2	L	21 33.83	2.074	6 26 38.27	134.63	24 33 50.6	260.1	67.63	14 49.4	54 18.4	I. N.
3	U	9 58.46	2.081	6 53 18.62	132.03	+23 35 11.0	-335.5	66.92	14 47.4	54 10.9	I. N.
3	L	22 22.55	1.984	7 19 26.17	129.19	22 20 4.6	414.4	66.13	14 45.8	54 5.2	I. N.
4	U	10 46.06	1.924	7 44 58.66	126.22	20 49 53.4	486.2	65.32	14 44.7	54 1.1	I. N.
4	L	23 8.97	1.885	8 9 55.54	123.27	19 6 4.6	580.6	64.50	14 44.0	53 58.5	I. N.S.
5	U	11 31.31	1.839	8 34 17.78	120.47	+17 10 8.5	-307.4	63.73	14 43.7	53 57.3	I. N.S.
5	L	23 53.11	1.796	8 58 7.73	117.91	15 3 35.8	666.7	63.01	14 43.7	53 57.5	I. II. S.
6	U	12 14.43	1.759	9 21 28.85	115.67	12 47 56.0	696.6	62.39	14 44.2	53 59.1	I. II. S.
7	L	0 35.35	1.729	9 44 25.56	113.85	10 24 37.5	733.3	61.88	14 45.0	54 2.0	I. II. S.
7	U	12 55.94	1.706	10 7 3.02	112.48	+ 7 55 5.6	-790.8	61.50	14 46.1	54 6.2	II. S.
8	L	1 16.32	1.691	10 29 26.96	111.60	5 20 44.0	781.5	61.27	14 47.6	54 11.8	II. S.
8	U	13 36.57	1.686	10 51 43.63	111.27	2 42 54.6	795.5	61.20	14 49.5	54 18.7	II. S.
9	L	1 56.81	1.689	11 13 59.68	111.50	+ 0 2 58.4	802.7	61.29	14 51.8	54 27.0	II. S.
9	U	14 17.15	1.703	11 36 22.03	112.32	- 2 37 43.2	-803.0	61.56	14 54.5	54 36.9	II. S.
10	L	2 37.72	1.727	11 58 57.98	113.78	5 17 47.3	796.4	62.00	14 57.6	54 48.3	II. S.
10	U	14 58.65	1.762	12 21 55.01	115.84	7 55 47.5	782.3	62.61	15 1.1	55 1.4	II. S.
11	L	3 20.05	1.807	12 45 20.78	118.56	10 30 12.1	780.4	63.39	15 5.1	55 16.1	II. S.
11	U	15 42.05	1.862	13 9 22.97	121.91	-12 59 22.6	-729.8	64.34	15 9.6	55 32.6	II. S.
12	L	4 4.79	1.928	13 34 9.11	125.88	15 21 31.0	689.9	65.44	15 14.6	55 50.9	II. S.
12	U	16 28.37	2.004	13 59 46.27	130.41	17 34 39.1	639.7	66.67	15 20.1	56 11.0	II. S.
13	L	4 52.91	2.087	14 26 20.63	135.39	19 36 36.4	577.9	68.00	15 26.1	56 32.9	II. S.
13	U	17 18.47	2.175	14 53 56.90	140.70	-21 25 1.0	-504.0	69.38	15 32.5	56 56.4	II. S.
14	L	5 45.10	2.265	15 22 37.68	146.11	22 57 20.5	417.0	70.76	15 39.3	57 21.3	II. S.
14	U	18 12.81	2.352	15 52 22.67	151.35	24 10 57.2	316.9	72.07	15 46.4	57 47.4	II. S.
15	L	6 41.51	2.431	16 23 8.01	156.11	25 3 14.4	204.0	73.23	15 53.7	58 14.4	II. S.
15	U	19 11.09	2.497	16 54 45.94	160.06	-25 31 47.9	- 79.9	74.17	16 1.2	58 41.7	II. S.

Feb. 2, U Defective Illumination of S. 0°.12.

Feb. 5, U Defective Illumination of S. 0°.04.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meri- dian.	Geocen- tric Semidi- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Feb. 15	U	19 11.09	2.497	16 54 45.94	160.06	-25 31 47.9	- 79.9	74.17	16 1.2	58 41.7	II. S.
16	L	7 41.35	2.544	17 27 4.85	162.89	25 34 36.8	+ 52.9	74.83	16 8.6	59 8.9	
16	U	20 12.05	2.569	17 59 50.07	164.41	25 10 17.7	190.8	75.16	16 15.8	59 35.3	II. N.
17	L	8 42.92	2.571	18 32 45.27	164.56	24 18 14.6	329.5	75.16	16 22.6	60 0.2	
17	U	21 13.68	2.552	19 5 54.18	163.39	-22 58 47.0	+ 464.1	74.84	16 28.7	60 22.8	II. N.
18	L	9 44.09	2.515	19 38 2.32	161.14	21 13 11.1	590.1	74.27	16 34.0	60 42.3	
18	U	22 13.97	2.464	20 9 58.45	158.12	19 3 34.7	703.5	73.51	16 38.3	60 58.0	II. N.
19	L	10 43.20	2.407	20 41 15.28	154.64	16 32 49.7	801.1	72.63	16 41.4	61 9.3	
19	U	23 11.72	2.347	21 11 49.43	151.05	-13 44 20.0	+ 880.7	71.73	16 43.1	61 15.7	II. N.
20	L	11 39.54	2.380	21 41 41.33	147.63	10 41 50.5	940.9	70.87	16 43.4	61 16.8	
21	U	0 6.71	2.239	22 10 54.21	144.58	7 29 16.3	981.4	70.10	16 42.3	61 12.5	
21	L	12 33.32	2.197	22 39 33.42	142.05	4 10 33.3	1002.5	69.46	16 39.7	61 3.0	
22	U	0 59.48	2.165	23 7 45.67	140.10	- 0 49 30.9	+1004.9	68.97	16 35.7	60 48.6	
22	L	13 25.31	2.143	23 35 38.25	138.77	+ 2 30 13.1	989.7	68.65	16 30.6	60 29.7	
23	U	1 50.94	2.131	0 3 18.60	138.05	5 45 16.7	968.3	68.49	16 24.4	60 7.0	I. S.
23	L	14 16.49	2.128	0 30 53.77	137.89	8 52 34.8	912.3	68.48	16 17.4	59 41.3	
24	U	2 42.05	2.133	0 58 29.97	138.31	+11 49 22.5	+ 883.5	68.59	16 9.8	59 13.3	I. S.
24	L	15 7.71	2.145	1 26 12.32	138.89	14 33 13.2	783.1	68.80	16 1.8	58 43.9	
25	U	3 33.54	2.160	1 54 4.50	139.82	17 1 59.8	703.0	69.08	15 53.7	58 13.8	I. S.
25	L	15 59.57	2.177	2 22 8.49	140.85	19 13 54.6	614.7	69.36	15 45.4	57 43.7	
26	U	4 25.79	2.193	2 50 24.46	141.79	+21 7 29.2	+ 629.0	69.63	15 37.3	57 14.2	I. S.
26	L	16 52.18	2.205	3 18 50.59	142.51	22 41 34.4	420.2	69.83	15 29.6	56 45.9	
27	U	5 18.68	2.211	3 47 23.32	142.86	23 55 21.7	317.3	69.94	15 22.4	56 19.3	I. S.
27	L	17 45.21	2.200	4 15 57.46	142.73	24 48 22.8	212.8	69.91	15 15.6	55 54.6	
28	U	6 11.65	2.197	4 44 26.71	142.04	+25 20 30.0	+ 108.6	69.74	15 9.5	55 32.2	I. S.
28	L	18 37.90	2.176	5 12 44.18	140.77	25 31 56.3	+ 6.3	69.41	15 4.1	55 12.2	
Mar. 1	U	7 3.84	2.146	5 40 43.01	138.95	25 23 13.0	- 92.8	68.92	14 59.3	54 54.7	I. N.S.
1	L	19 29.36	2.107	6 8 16.95	136.64	24 55 8.2	187.1	68.30	14 55.2	54 39.7	
2	U	7 54.39	2.083	6 35 20.86	133.96	+24 8 43.4	- 276.0	67.58	14 51.8	54 27.3	I. N.
2	L	20 18.85	2.014	7 1 51.05	131.04	23 5 10.7	358.4	66.78	14 49.1	54 17.4	
3	U	8 42.72	1.984	7 27 45.40	128.01	21 45 49.1	434.0	65.94	14 47.1	54 9.9	I. N.
3	L	21 5.99	1.914	7 53 3.39	124.90	20 12 2.4	502.6	65.10	14 45.7	54 4.7	
4	U	9 28.66	1.866	8 17 46.01	122.13	+18 25 15.6	- 564.9	64.29	14 44.9	54 1.7	I. N.
4	L	21 50.79	1.822	8 41 55.50	119.80	16 26 54.8	618.3	63.53	14 44.6	54 0.7	
5	U	10 12.42	1.784	9 5 35.23	117.19	14 18 24.5	665.6	62.86	14 44.8	54 1.6	I. N.
5	L	22 33.63	1.752	9 28 49.45	115.25	12 1 8.6	705.9	62.29	14 45.5	54 4.2	
6	U	10 54.49	1.727	9 51 43.04	113.76	+ 9 36 29.7	- 739.5	61.85	14 46.7	54 8.4	I. N.
6	L	23 15.11	1.710	10 14 21.50	112.74	7 5 49.5	766.1	61.54	14 48.2	54 14.1	
7	U	11 35.57	1.701	10 36 50.69	112.22	4 30 29.4	785.9	61.33	14 50.1	54 21.0	I. N.S.
7	L	23 55.98	1.701	10 59 16.85	112.33	+ 1 51 52.3	799.9	61.37	14 52.3	54 29.1	
8	U	12 16.44	1.711	11 21 46.41	112.80	- 0 48 38.2	- 804.9	61.53	14 54.8	54 38.3	I. II. S.
9	L	0 37.07	1.730	11 44 26.05	113.92	3 29 35.1	803.2	61.85	14 57.6	54 48.6	
9	U	12 57.99	1.768	12 7 22.58	115.00	6 9 27.3	794.0	62.33	15 0.7	54 59.8	II. S.
10	L	1 19.30	1.795	12 30 42.85	117.87	8 46 39.3	776.5	62.98	15 4.0	55 11.9	
10	U	13 41.11	1.842	12 54 33.66	120.69	-11 19 29.1	- 759.3	63.78	15 7.6	55 25.0	II. S.

Mar. 1, U Defective Illumination of N. 0° 24.
Mar. 7, U Defective Illumination of N. 0° 12.

Mar. 8, U Defective Illumination of I. 0° 31.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Weath. Moon Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Mar. 10	U	13 41.11	1.842	12 54 33.66	120.60	-11 19 29.1	-750.2	63.78	15 7.6	55 25.0	II. S.
11	L	2 3.54	1.866	13 19 1.58	124.06	13 46 7.4	714.5	64.71	15 11.4	55 39.0	
11	U	14 26.69	1.902	13 44 12.73	127.80	16 4 37.6	668.7	65.77	15 15.4	55 53.9	II. S.
12	L	2 50.65	2.032	14 10 12.42	132.12	18 12 54.6	612.3	66.92	15 19.8	56 9.7	
12	U	15 15.49	2.107	14 37 4.76	136.64	-20 8 46.5	-544.4	68.13	15 24.3	56 26.5	II. S.
13	L	3 41.23	2.184	15 4 52.12	141.26	21 49 55.6	465.0	69.34	15 29.1	56 44.2	
13	U	16 7.90	2.259	15 33 34.61	145.79	23 14 1.9	374.1	70.52	15 34.2	57 2.8	II. S.
14	L	4 35.44	2.329	16 3 9.63	149.96	24 18 48.5	271.9	71.59	15 39.5	57 22.2	
14	U	17 3.75	2.389	16 33 31.54	153.56	-25 2 8.4	-159.8	72.50	15 45.0	57 42.3	II. S.
15	L	5 32.70	2.434	17 4 31.70	156.31	25 22 12.7	-30.8	73.18	15 50.6	58 3.0	
15	U	18 2.11	2.463	17 35 58.96	158.96	26 17 39.8	+85.9	73.61	15 56.3	58 23.9	II. N.S.
16	L	6 31.75	2.474	18 7 40.54	158.70	24 47 41.4	213.3	73.77	16 2.1	58 44.9	
16	U	19 1.41	2.466	18 39 23.24	158.38	-23 52 10.2	+340.8	73.65	16 7.7	59 5.5	II. N.
17	L	7 30.88	2.443	19 10 54.79	156.86	22 31 40.2	463.1	73.29	16 13.1	59 25.2	
17	U	20 0.00	2.466	19 42 5.02	154.74	20 47 26.5	577.6	72.75	16 18.1	59 43.7	II. N.
18	L	8 28.64	2.385	20 12 46.62	152.14	18 41 20.1	681.5	72.08	16 22.6	60 0.3	
18	U	20 56.74	2.318	20 42 55.45	149.38	-16 15 43.2	+772.4	71.35	16 26.5	60 14.5	II. N.
19	L	9 24.28	2.372	21 12 30.59	146.55	13 33 21.4	848.6	70.63	16 29.6	60 25.8	
19	U	21 51.29	2.280	21 41 33.76	144.83	10 37 19.1	909.0	69.96	16 31.7	60 33.6	II. N.
20	L	10 17.83	2.186	22 10 8.90	141.91	7 30 52.1	952.6	69.38	16 32.7	60 37.6	
20	U	22 44.00	2.108	22 38 21.51	140.29	-4 17 23.7	+979.1	68.95	16 32.7	60 37.4	II. N.
21	L	11 9.90	2.151	23 6 18.13	139.34	-1 0 20.6	988.4	68.67	16 31.5	60 32.9	
21	U	23 35.65	2.143	23 34 5.69	138.78	+2 16 51.5	990.7	68.54	16 29.1	60 24.1	
22	L	12 1.36	2.145	0 1 51.12	138.80	5 30 51.0	966.5	68.55	16 25.5	60 11.1	
23	U	0 27.15	2.185	0 29 40.83	139.49	+8 33 23.9	+916.4	68.71	16 20.9	59 54.3	
23	L	12 53.10	2.171	0 57 40.33	140.49	11 36 26.1	861.6	68.97	16 15.5	59 34.2	
24	U	1 19.28	2.193	1 25 53.83	141.79	14 22 7.9	793.3	69.33	16 9.2	59 11.2	I. S.
24	L	13 45.74	2.217	1 54 23.83	143.22	16 52 56.1	712.9	69.71	16 2.3	58 46.0	
25	U	2 12.48	2.240	2 23 10.90	144.80	+19 6 37.5	+822.3	70.09	15 55.0	58 19.2	I. S.
25	L	14 39.48	2.259	2 52 13.42	145.76	21 1 21.2	823.7	70.41	15 47.5	57 51.7	
26	U	3 6.87	2.272	3 21 27.60	146.52	22 35 41.5	419.0	70.64	15 40.0	57 24.0	I. S.
26	L	15 33.96	2.275	3 50 47.65	146.72	23 48 40.3	310.5	70.73	15 32.6	56 56.7	
27	U	4 1.22	2.267	4 20 6.27	146.37	+24 39 47.8	+200.8	70.64	15 25.4	56 30.4	I. S.
27	L	16 28.82	2.248	4 49 15.23	145.11	25 9 1.8	+92.0	70.38	15 18.6	56 5.5	
28	U	4 45.13	2.217	5 18 6.17	143.27	25 16 46.7	-13.8	69.94	15 12.3	55 42.5	I. S.
28	L	17 21.50	2.177	5 46 31.28	140.82	25 3 49.1	114.8	69.33	15 6.6	55 21.6	
29	U	5 47.34	2.128	6 14 24.02	137.80	+24 31 14.3	-209.9	68.60	15 1.6	55 3.2	I. N.
29	L	18 12.56	2.074	6 41 39.61	134.86	23 40 20.5	297.9	67.76	14 57.3	54 47.3	
30	U	6 37.11	2.018	7 8 15.08	131.24	22 32 34.5	378.5	66.86	14 53.7	54 34.1	I. N.
30	L	19 0.98	1.961	7 34 9.45	127.64	21 9 26.9	451.5	65.95	14 50.9	54 23.7	
31	U	7 24.18	1.906	7 59 23.51	124.55	+19 32 23.7	-516.9	65.04	14 48.7	54 15.9	I. N.
31	L	19 46.75	1.856	8 23 59.63	121.32	17 43 9.0	575.1	64.20	14 47.4	54 10.9	
Apr. 1	U	8 8.75	1.811	8 48 1.37	118.53	15 42 53.6	626.3	63.44	14 46.7	54 8.5	I. N.
1	L	20 30.25	1.774	9 11 33.32	116.57	13 33 5.0	670.7	62.78	14 46.7	54 8.5	
2	U	8 51.35	1.744	9 34 40.81	114.77	+11 15 2.3	-708.7	62.24	14 47.4	54 10.9	I. N.

Mar. 15, U Defective Illumination of N. 0° 13.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Apr. 2	U	8 51.35	1.744	9 34 40.81	114.77	+11 15 2.3	-708.7	62.24	14 47.4	54 10.9	I. N.
2	L	21 12.13	1.723	9 57 29.69	113.47	8 50 2.2	740.4	61.84	14 48.6	54 15.5	
3	U	9 32.71	1.710	10 20 6.25	112.71	6 19 19.8	768.8	61.59	14 50.4	54 22.1	I. N.
3	L	21 53.20	1.706	10 42 37.06	112.51	3 44 11.4	784.7	61.50	14 52.7	54 30.5	
4	U	10 13.70	1.712	11 5 8.92	112.88	+ 1 55 4.4	-797.0	61.58	14 55.5	54 40.5	I. N.
4	L	22 34.34	1.728	11 27 48.74	113.85	- 1 34 9.4	802.4	61.82	14 58.5	54 51.8	
5	U	10 55.23	1.754	11 50 43.58	115.39	4 14 33.9	800.3	62.22	15 1.9	55 4.3	I. N.S.
5	L	23 16.48	1.789	12 14 0.46	117.52	6 53 45.7	790.2	62.80	15 5.6	55 17.8	
6	U	11 38.21	1.834	12 37 46.36	120.22	- 9 30 3.3	-771.2	63.53	15 9.5	55 32.1	I. S.
7	L	0 0.54	1.888	13 2 7.96	123.47	12 1 36.4	742.6	64.40	15 13.5	55 46.9	
7	U	12 23.56	1.950	13 27 11.45	127.20	14 26 24.5	703.6	65.41	15 17.7	56 2.0	II. S.
8	L	0 47.37	2.019	13 53 2.21	131.32	16 42 17.8	653.3	66.50	15 21.8	56 17.4	
8	U	13 12.04	2.092	14 19 44.35	135.73	-18 46 58.0	-591.3	67.67	15 26.1	56 32.9	II. S.
9	L	1 37.59	2.167	14 47 20.30	140.26	20 38 0.8	517.1	68.85	15 30.3	56 48.3	
9	U	14 4.05	2.241	15 15 50.17	144.68	22 12 59.9	430.7	70.00	15 34.5	57 3.7	II. S.
10	L	2 31.35	2.309	15 45 11.29	148.76	23 29 32.9	333.0	71.05	15 38.6	57 18.9	
10	U	14 59.42	2.367	16 15 18.06	152.24	-24 25 28.9	-224.8	71.94	15 42.7	57 33.8	II. S.
11	L	3 28.10	2.411	16 46 1.77	154.89	24 58 56.3	-108.6	72.62	15 46.7	57 48.5	
11	U	15 57.20	2.438	17 17 11.22	156.51	25 8 31.9	+ 13.2	73.05	15 50.6	58 2.9	II. S.
12	L	4 26.52	2.446	17 48 33.52	157.02	24 53 27.7	137.6	73.20	15 54.4	58 17.0	
12	U	16 55.84	2.436	18 19 55.41	156.45	-24 13 34.3	+200.9	73.09	15 58.1	58 30.5	II. N.S.
13	L	5 24.94	2.411	18 51 4.47	154.92	23 9 22.9	330.0	72.73	16 1.7	58 43.6	
13	U	17 53.65	2.373	19 21 50.40	152.64	21 42 1.4	492.1	72.18	16 5.1	58 56.0	II. N.
14	L	6 21.86	2.327	19 52 5.74	149.87	19 53 9.5	594.8	71.50	16 8.2	59 7.5	
14	U	18 49.49	2.377	20 21 46.24	146.87	-17 44 51.2	+686.2	70.75	16 11.1	59 18.0	II. N.
15	L	7 16.52	2.228	20 50 50.82	143.91	15 19 29.5	765.2	69.99	16 13.6	59 27.3	
15	U	19 42.98	2.183	21 19 21.23	141.21	12 39 39.0	830.9	69.28	16 15.7	59 35.0	II. N.
16	L	8 8.94	2.145	21 47 21.43	138.91	9 48 2.8	882.8	68.67	16 17.3	59 40.9	
16	U	20 34.50	2.116	22 14 57.14	137.14	- 6 47 29.2	+920.3	68.18	16 18.3	59 44.7	II. N.
17	L	8 59.76	2.096	22 42 15.17	135.97	3 40 49.7	943.7	67.85	16 18.7	59 46.1	
17	U	21 24.85	2.087	23 9 22.99	135.44	- 0 30 58.3	952.4	67.68	16 18.4	59 44.9	II. N.
18	L	9 49.90	2.089	23 36 28.30	135.55	+ 2 39 9.2	946.4	67.68	16 17.3	59 40.9	
18	U	22 15.03	2.101	0 3 38.56	136.26	+ 5 46 36.6	+925.7	67.84	16 15.5	59 34.1	II. N.
19	L	10 40.35	2.122	0 31 0.61	137.50	8 48 27.8	890.4	68.13	16 12.8	59 24.3	
19	U	23 5.97	2.150	0 58 40.33	139.18	11 41 49.3	840.9	68.55	16 9.4	59 11.7	
20	L	11 31.96	2.182	1 26 42.12	141.15	14 23 53.2	777.6	69.04	16 5.2	58 56.4	
20	U	23 58.36	2.217	1 55 8.53	143.26	+16 51 59.9	+701.5	69.57	16 0.4	58 38.7	
21	L	12 25.17	2.251	2 23 59.89	145.28	19 3 43.8	614.0	70.08	15 55.0	58 19.0	
22	U	0 52.36	2.280	2 53 14.05	147.01	20 56 57.4	516.8	70.52	15 49.2	57 57.6	
22	L	13 19.85	2.300	3 22 46.22	148.26	22 29 56.9	412.0	70.85	15 43.0	57 35.1	
23	U	1 47.52	2.310	3 52 29.28	148.81	+23 41 27.5	+302.4	71.01	15 36.7	57 11.9	I. S.
23	L	14 15.22	2.305	4 22 14.23	148.55	24 30 45.4	190.5	70.98	15 30.4	56 48.6	
24	U	2 42.79	2.287	4 51 50.95	147.43	24 57 40.7	+ 79.0	70.74	15 24.1	56 25.7	I. S.
24	L	15 10.05	2.264	5 21 9.19	145.48	25 2 35.0	- 29.3	70.29	15 18.1	56 3.5	
25	U	3 36.84	2.209	5 49 59.51	142.80	+24 46 18.6	-132.4	69.65	15 12.4	55 42.6	I. S.

April 5, U Defective Illumination of S. 0' 24.

April 12, U Defective Illumination of S. 0' 23.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Apr. 25	U	3 36.84	2.209	5 49 59.51	142.80	+24 46 18.6	-132.4	69.65	15 12.4	55 42.6	I. S.
25	L	16 3.04	2.156	6 18 14.11	139.56	24 10 4.4	228.7	68.85	15 7.1	55 23.4	
26	U	4 28.55	2.096	6 45 47.32	135.93	23 15 21.8	317.1	67.95	15 2.4	55 6.0	I. N.
26	L	16 53.32	2.033	7 12 35.84	132.14	22 3 49.0	397.0	66.99	14 58.3	54 50.9	
27	U	5 17.33	1.970	7 38 38.71	128.36	+20 37 8.4	-468.4	66.01	14 54.8	54 38.3	I. N.
27	L	17 40.60	1.910	8 3 57.12	124.75	18 57 1.1	531.4	65.06	14 52.1	54 28.2	
28	U	6 3.18	1.855	8 28 33.96	121.45	17 5 4.0	586.7	64.17	14 50.1	54 20.8	I. N.
28	L	18 25.15	1.807	8 52 33.54	118.56	15 2 48.2	634.7	63.38	14 48.8	54 16.1	
29	U	6 46.58	1.767	9 16 1.23	116.15	+12 51 38.4	-675.8	62.70	14 48.3	54 14.2	I. N.
29	L	19 7.58	1.736	9 39 3.15	114.27	10 32 53.6	710.6	62.16	14 48.5	54 15.1	
30	U	7 28.27	1.714	10 1 45.96	112.97	8 7 48.0	739.3	61.78	14 49.5	54 18.6	I. N.
30	L	19 48.75	1.702	10 24 16.77	112.27	5 37 33.2	762.2	61.56	14 51.1	54 24.7	
May 1	U	8 9.16	1.701	10 46 42.86	112.19	+ 3 3 18.9	-779.2	61.50	14 53.4	54 33.2	I. N.
1	L	20 29.62	1.710	11 9 11.82	112.74	+ 0 26 16.7	790.1	61.63	14 56.4	54 44.0	
2	U	8 50.25	1.730	11 31 51.32	113.95	- 2 12 18.4	794.6	61.94	14 59.9	54 56.8	I. N.
2	L	21 11.18	1.761	11 54 49.14	115.80	4 51 5.3	792.0	62.42	15 3.9	55 11.4	
3	U	9 32.55	1.802	12 18 13.08	118.30	- 7 28 35.2	-781.5	63.08	15 8.3	55 27.6	I. N.
3	L	21 54.48	1.854	12 42 10.81	121.43	10 3 8.8	762.5	63.90	15 13.0	55 44.9	
4	U	10 17.10	1.916	13 6 49.65	125.14	12 32 54.6	733.4	64.88	15 18.0	56 3.2	I. N.
4	L	22 40.51	1.987	13 32 16.35	129.39	14 55 47.9	693.5	65.98	15 23.1	56 22.0	
5	U	11 4.81	2.064	13 58 36.61	134.05	-17 9 30.7	-641.5	67.18	15 28.3	56 41.1	I. N. S.
5	L	23 30.06	2.146	14 25 54.58	139.98	19 11 33.2	576.6	68.44	15 33.5	57 0.1	
6	U	11 56.31	2.229	14 54 12.15	143.95	20 59 16.5	498.3	69.69	15 38.5	57 18.6	I. II. S.
7	L	0 23.54	2.308	15 23 28.39	148.71	22 29 59.4	406.6	70.88	15 43.3	57 36.3	
7	U	12 51.67	2.378	15 53 38.90	152.94	-23 41 5.6	-302.4	71.94	15 47.9	57 53.1	II. S.
8	L	1 20.56	2.435	16 24 35.60	156.35	24 30 15.1	187.6	72.79	15 52.1	58 8.5	
8	U	13 50.03	2.474	16 56 6.98	158.67	24 55 34.8	- 64.7	73.37	15 55.9	58 22.5	II. S.
9	L	2 19.84	2.491	17 27 58.74	159.73	24 55 49.5	+ 62.7	73.65	15 59.3	58 35.0	
9	U	14 49.73	2.487	17 59 55.31	159.47	-24 30 29.0	+190.5	73.63	16 2.3	58 45.8	II. N. S.
10	L	3 19.44	2.462	18 31 41.35	158.01	23 39 51.4	314.8	73.31	16 4.8	58 55.0	
10	U	15 48.76	2.421	19 3 3 3.39	155.52	22 25 0.9	432.1	72.73	16 6.8	59 2.5	II. N.
11	L	4 17.51	2.368	19 33 51.02	152.32	20 47 40.4	539.5	71.98	16 8.4	59 8.4	
11	U	16 45.57	2.308	20 3 57.58	148.73	-18 50 2.5	+634.7	71.12	16 9.6	59 12.8	II. N.
12	L	5 12.90	2.247	20 33 20.20	145.05	16 34 39.5	716.9	70.22	16 10.4	59 15.7	
12	U	17 39.51	2.189	21 1 59.50	141.55	14 4 13.7	785.2	69.34	16 10.8	59 17.2	II. N.
13	L	6 5.46	2.137	21 29 58.92	138.44	11 21 31.7	839.5	68.56	16 10.9	59 17.3	
13	U	18 30.83	2.094	21 57 24.04	135.86	- 8 29 19.2	+880.3	67.89	16 10.6	59 16.2	II. N.
14	L	6 55.76	2.062	22 24 21.96	133.91	5 30 18.6	907.7	67.37	16 9.9	59 13.8	
14	U	19 20.37	2.041	22 51 0.70	132.67	- 2 27 8.9	921.8	67.03	16 8.9	59 10.0	II. N.
15	L	7 44.80	2.032	23 17 28.71	132.12	+ 0 37 34.2	923.3	66.87	16 7.5	59 4.9	
15	U	20 9.19	2.035	23 43 54.47	132.29	+ 3 41 17.4	+911.8	66.88	16 5.7	58 58.5	II. N.
16	L	8 33.68	2.049	0 10 26.16	133.11	6 41 29.0	887.9	67.07	16 3.6	58 50.6	
16	U	20 58.39	2.072	0 37 11.32	134.51	9 35 37.6	851.4	67.41	16 1.1	58 41.3	II. N.
17	L	9 23.43	2.103	1 4 16.40	136.41	12 21 12.5	802.4	67.87	15 58.1	58 30.4	
17	U	21 48.89	2.141	1 31 46.45	138.65	+14 55 45.4	+741.1	68.41	15 54.8	58 18.2	II. N.

May 5, U Defective Illumination of N. 0°.11.

May 9, U Defective Illumination of N. 0°.23.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Ver. per Hour of Long.	Right Ascension of Center.	Ver. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Papa- ling Me- ridian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
May 17	U	21 48.89	2.141	1 31 46.45	138.65	+14 55 45.4	+741.1	68.41	15 54.8	58 18.2	II. N.
18	L	10 14.82	2.181	1 59 44.64	141.05	17 16 51.6	668.1	69.00	15 51.0	58 4.5	
18	U	22 41.23	2.230	2 28 11.93	143.45	19 22 14.2	584.0	69.58	15 46.9	57 49.5	II. N.
19	L	11 8.10	2.286	2 57 6.62	145.59	21 9 48.9	490.3	70.10	15 42.5	57 33.3	
19	U	23 35.35	2.284	3 26 24.31	147.25	+22 37 49.9	+388.6	70.51	15 37.8	57 16.1	
20	L	12 2.86	2.300	3 55 57.95	148.22	23 44 55.3	281.5	70.74	15 32.9	56 58.1	
21	U	0 30.49	2.302	4 25 38.30	148.35	24 30 12.7	171.3	70.78	15 27.9	56 39.7	
21	L	12 58.06	2.289	4 55 14.68	147.56	24 53 22.0	+ 60.6	70.60	15 22.9	56 21.1	
22	U	1 25.36	2.280	5 24 36.02	146.85	+24 54 37.2	- 47.5	70.20	15 17.8	56 2.6	I. S.
22	L	13 52.24	2.219	5 53 31.85	143.33	24 34 42.4	150.7	69.59	15 12.9	55 44.7	
23	U	2 18.56	2.166	6 21 53.26	140.15	23 54 48.0	247.2	68.82	15 8.3	55 27.6	I. N.
23	L	14 44.19	2.105	6 49 33.53	136.51	22 56 24.1	235.4	67.92	15 3.9	55 11.6	
24	U	3 9.06	2.041	7 16 28.50	132.64	+21 41 13.3	-414.9	66.95	15 0.0	54 57.1	I. N.
24	L	15 33.16	1.976	7 42 36.54	128.72	20 11 3.4	485.2	65.95	14 56.5	54 44.3	
25	U	3 56.49	1.913	8 7 56.35	124.95	18 27 43.0	546.7	64.98	14 53.5	54 33.5	I. N.
25	L	16 19.09	1.885	8 32 36.57	121.48	16 32 55.5	509.9	64.07	14 51.2	54 24.9	
26	U	4 41.04	1.804	8 56 35.41	118.40	+14 23 18.9	-645.1	63.26	14 49.5	54 18.7	I. N.
26	L	17 2.43	1.761	9 20 0.29	115.83	12 15 23.2	683.1	62.56	14 48.5	54 15.0	
27	U	5 23.35	1.728	9 42 57.46	113.80	9 55 81.3	714.5	62.01	14 48.2	54 13.9	I. N.
27	L	17 43.93	1.704	10 5 33.83	112.37	7 29 59.0	739.3	61.62	14 48.6	54 15.5	
28	U	6 4.28	1.680	10 27 56.74	111.56	+ 4 59 58.0	-760.4	61.39	14 49.8	54 19.9	I. N.
28	L	18 24.54	1.688	10 50 13.84	111.41	+ 2 26 36.2	773.3	61.35	14 51.8	54 27.0	
29	U	6 44.84	1.686	11 12 33.08	111.92	- 0 8 58.5	781.5	61.48	14 54.4	54 36.8	I. N.
29	L	19 5.30	1.716	11 35 2.60	113.12	2 45 36.5	783.8	61.80	14 57.8	54 49.1	
30	U	7 26.07	1.748	11 57 50.69	115.02	- 5 22 3.8	-779.6	62.31	15 1.8	55 3.9	I. N.
30	L	19 47.29	1.791	12 21 5.74	117.61	7 56 58.9	768.2	63.01	15 6.5	55 21.0	
31	U	8 9.10	1.846	12 44 56.12	120.90	10 28 50.1	748.8	63.89	15 11.7	55 40.0	I. N.
31	L	20 31.63	1.911	13 9 30.00	124.86	12 55 52.7	719.9	64.92	15 17.3	56 0.8	
June 1	U	8 55.02	1.967	13 34 55.06	129.48	-15 16 7.6	-880.6	66.10	15 23.4	56 23.0	I. N.
1	L	21 19.36	2.071	14 1 17.95	134.47	17 27 19.7	639.2	67.40	15 29.7	56 46.1	
2	U	9 44.75	2.161	14 23 43.86	139.88	19 26 58.0	564.8	68.76	15 36.1	57 9.3	I. N.
2	L	22 11.24	2.263	14 57 15.61	145.41	21 12 18.4	486.8	70.13	15 42.6	57 33.5	
3	U	10 38.81	2.342	15 26 52.96	150.75	-22 40 29.5	-303.3	71.43	15 48.9	57 56.7	I. N.S.
3	L	23 7.41	2.422	15 57 31.73	155.58	23 48 40.7	286.5	72.60	15 55.0	58 18.9	
4	U	11 36.89	2.488	16 29 3.47	159.53	24 34 15.5	167.5	73.64	16 0.6	58 39.6	I. N.S.
5	L	0 7.03	2.533	17 1 15.53	162.26	24 56 4.8	- 39.5	74.19	16 5.7	58 58.3	
5	U	12 37.58	2.555	17 33 51.86	163.55	-24 49 41.4	+ 93.8	74.50	16 10.1	59 14.6	II. N.S.
6	L	1 8.24	2.551	18 6 34.58	163.32	24 17 30.7	227.7	74.46	16 13.8	59 28.2	
6	U	13 38.71	2.524	18 39 5.98	161.69	23 18 55.0	357.2	74.09	16 16.7	59 38.9	II. N.S.
7	L	2 8.73	2.477	19 11 10.39	158.88	21 55 12.6	478.1	73.44	16 18.8	59 46.4	
7	U	14 38.10	2.416	19 42 35.73	155.24	-20 8 28.6	+586.9	72.59	16 20.0	59 50.9	II. N.
8	L	3 6.69	2.248	20 13 14.30	151.14	18 1 23.2	681.4	71.62	16 20.4	59 52.3	
8	U	15 34.45	2.279	20 43 2.78	146.96	15 36 57.5	780.2	70.61	16 20.1	59 51.0	II. N.
9	L	4 1.39	2.212	21 12 1.80	142.95	12 58 23.1	822.9	69.64	16 19.0	59 47.0	
9	U	16 27.57	2.153	21 40 15.16	139.37	-10 8 51.5	+809.8	68.75	16 17.3	59 40.8	II. N.

June 4, U Defective Illumination of N. 0°.38.
June 5, U Defective Illumination of N. 0°.33.

June 6, U Defective Illumination of S. 0°.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	" ' "	"	s	" "	" "	
June 9	U	16 27.57	2.153	21 40 15.16	139.37	-10 8 51.5	+869.8	68.75	16 17.3	59 40.8	II. N.
10	L	4 53.09	2.103	22 7 48.93	136.37	7 11 27.9	901.7	68.00	16 15.0	59 32.6	
10	U	17 18.09	2.064	22 34 50.77	134.06	4 9 8.5	919.3	67.41	16 12.3	59 22.7	II. N.
11	L	5 42.69	2.038	23 1 29.17	132.47	-1 4 39.4	923.4	67.01	16 9.3	59 11.5	
11	U	18 7.05	2.024	23 27 53.03	131.03	+1 59 23.6	+915.0	66.79	16 5.9	58 59.1	II. N.
12	L	6 31.31	2.022	23 54 11.21	131.52	5 0 32.6	894.5	66.75	16 2.3	58 45.9	
12	U	18 55.62	2.032	0 20 32.15	132.09	7 56 26.4	862.5	66.89	15 58.6	58 32.1	II. N.
13	L	7 20.11	2.051	0 47 3.57	133.25	10 44 49.7	819.4	67.17	15 54.6	58 17.7	
13	U	19 44.88	2.079	1 13 52.14	134.92	+13 23 30.0	+765.5	67.58	15 50.6	58 3.0	II. N.
14	L	8 10.02	2.113	1 41 3.13	136.96	15 50 18.8	700.9	68.09	15 46.5	57 47.9	
14	U	20 35.59	2.150	2 8 40.02	139.20	18 3 12.4	626.3	68.63	15 42.3	57 32.6	II. N.
15	L	9 1.62	2.187	2 36 44.11	141.46	20 0 14.0	542.4	69.17	15 38.1	57 17.2	
15	U	21 28.06	2.221	3 5 14.25	143.51	+21 39 36.8	+450.0	69.66	15 33.9	57 1.6	II. N.
16	L	9 54.91	2.249	3 34 6.72	145.15	22 59 48.6	350.8	70.04	15 29.7	56 46.0	
16	U	22 22.01	2.265	4 3 15.22	146.15	23 59 37.6	246.6	70.27	15 25.4	56 30.3	II. N.
17	L	10 49.23	2.269	4 32 31.35	146.40	24 38 16.7	139.6	70.30	15 21.1	56 14.7	
17	U	23 16.41	2.259	5 1 45.23	145.77	+24 55 27.2	+32.2	70.13	15 16.9	55 59.3	
18	L	11 43.39	2.224	5 30 46.39	144.28	24 51 19.8	-72.9	69.75	15 12.8	55 44.2	
19	U	0 9.98	2.196	5 59 24.76	141.99	24 26 34.5	173.7	69.17	15 8.8	55 29.5	
19	L	12 36.05	2.147	6 27 31.60	139.05	23 42 16.6	268.0	68.44	15 5.0	55 15.5	
20	U	1 1.49	2.091	6 55 0.08	135.64	+22 39 51.1	-354.7	67.57	15 1.4	55 2.2	I. N.
20	L	13 26.21	2.029	7 21 45.72	131.96	21 20 56.9	432.8	66.63	14 58.0	54 49.9	
21	U	1 50.19	1.967	7 47 46.46	128.18	19 47 20.6	501.8	65.67	14 55.0	54 38.8	I. N.
21	L	14 18.42	1.906	8 13 2.39	124.51	18 0 50.7	561.7	64.72	14 52.3	54 29.0	
22	U	2 35.94	1.849	8 37 35.67	121.09	+16 3 13.4	-613.1	63.82	14 50.1	54 20.9	I. N.
22	L	14 57.81	1.798	9 1 29.98	118.03	13 56 9.3	656.2	63.02	14 48.4	54 14.5	
23	U	3 19.12	1.755	9 24 50.23	115.43	11 41 13.4	691.8	62.33	14 47.2	54 10.1	I. N.
23	L	15 39.96	1.720	9 47 42.24	113.34	9 19 52.5	720.5	61.78	14 46.5	54 7.8	
24	U	4 0.44	1.695	10 10 12.54	111.82	+6 53 27.1	-742.7	61.38	14 46.5	54 7.8	I. N.
24	L	16 20.67	1.679	10 32 28.16	110.89	4 23 11.7	758.9	61.15	14 47.2	54 10.2	
25	U	4 40.78	1.675	10 54 36.52	110.61	+1 50 16.8	769.3	61.09	14 48.6	54 15.2	I. N.
25	L	17 0.90	1.681	11 16 45.34	110.98	-0 44 9.6	774.1	61.21	14 50.6	54 22.8	
26	U	5 21.16	1.698	11 39 2.59	112.02	-3 18 58.9	-773.2	61.51	14 53.4	54 33.0	I. N.
26	L	17 41.70	1.727	12 1 36.48	113.76	5 53 0.5	766.0	62.01	14 56.9	54 45.9	
27	U	6 2.65	1.767	12 24 35.37	116.19	8 24 58.1	752.3	62.69	15 1.2	55 1.4	I. N.
27	L	18 24.16	1.820	12 48 7.72	119.32	10 53 27.2	731.3	63.55	15 6.1	55 19.5	
28	U	6 46.37	1.883	13 12 21.89	123.15	-13 16 53.3	-701.6	64.58	15 11.6	55 39.9	I. N.
28	L	19 9.40	1.957	13 37 25.97	127.63	15 33 27.7	662.3	65.76	15 17.8	56 2.5	
29	U	7 33.38	2.041	14 3 27.29	132.67	17 41 6.5	612.2	67.07	15 24.5	56 27.0	I. N.
29	L	19 58.42	2.133	14 30 31.94	138.16	19 37 29.8	549.6	68.47	15 31.6	56 53.1	
30	U	8 24.58	2.228	14 58 44.05	143.88	-21 20 2.4	-473.5	69.89	15 39.0	57 20.2	I. N.
30	L	20 51.88	2.322	15 28 4.89	149.56	22 45 57.6	383.3	71.28	15 46.5	57 47.9	
July 1	U	9 20.29	2.410	15 53 32.11	154.88	23 52 24.3	278.9	72.55	15 54.1	58 15.7	I. N.
1	L	21 49.68	2.486	16 29 59.01	159.45	24 36 38.4	161.4	73.63	16 1.5	58 42.8	
2	U	10 19.89	2.544	17 2 14.45	162.91	-24 56 16.2	-33.3	74.43	16 8.5	59 8.5	I. N.S.

July 2, U Defective Illumination of N. 0°.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi-d. Pass- ing Meridian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
July 2	U	10 19.89	2.544	17 2 14.45	162.91	-24 56 16.2	-33.3	74.43	16 8.5	59 8.5	I. N.S.
2	L	22 50.65	2.578	17 35 3.31	164.98	24 49 30.5	+101.8	74.90	16 15.0	59 32.3	
3	U	11 21.67	2.587	18 8 7.83	165.51	24 15 24.3	239.2	75.01	16 20.7	59 53.3	I. N.S.
3	L	23 52.64	2.571	18 41 9.50	164.53	23 14 0.0	373.9	74.77	16 25.5	60 11.0	
4	U	12 23.28	2.533	19 13 51.20	162.23	-21 46 21.6	+500.8	74.22	16 29.3	60 24.9	II. N.S.
5	L	0 53.35	2.478	19 45 58.96	158.93	19 54 28.9	615.6	73.43	16 31.9	60 34.6	
5	U	13 22.70	2.413	20 17 23.08	155.02	17 41 7.8	715.2	72.50	16 33.4	60 40.0	II. N.
6	L	1 51.24	2.344	20 47 58.48	150.87	15 9 34.4	797.4	71.51	16 33.7	60 41.0	
6	U	14 18.96	2.376	21 17 44.29	146.81	-12 23 22.3	+861.6	70.53	16 32.8	60 37.8	II. N.
7	L	2 45.90	2.314	21 46 43.23	143.09	9 26 9.4	907.6	69.62	16 30.8	60 30.6	
7	U	15 12.14	2.161	22 15 0.56	139.89	6 21 29.3	936.2	68.84	16 27.9	60 19.8	II. N.
8	L	3 37.81	2.119	22 42 43.39	137.35	3 12 44.9	948.5	68.22	16 24.2	60 6.0	
8	U	16 3.05	2.089	23 9 59.87	135.51	-0 3 5.6	+945.6	67.77	16 19.7	59 49.6	II. N.
9	L	4 27.99	2.070	23 36 58.54	134.39	+3 4 34.2	928.8	67.50	16 14.7	59 31.2	
9	U	16 52.77	2.063	0 3 47.94	133.96	6 7 34.4	899.2	67.41	16 9.3	59 11.4	II. N.
10	L	5 17.54	2.067	0 30 36.17	134.18	9 3 27.5	857.8	67.47	16 3.6	58 50.6	
10	U	17 42.40	2.080	0 57 30.54	134.97	+11 49 58.0	+805.5	67.68	15 57.8	58 29.3	II. N.
11	L	6 7.47	2.100	1 24 37.26	136.22	14 24 59.4	743.1	68.01	15 52.0	58 7.9	
11	U	18 32.83	2.126	1 52 1.05	137.79	16 46 34.6	671.2	68.41	15 46.2	57 46.7	II. N.
12	L	6 58.52	2.155	2 19 44.94	139.54	18 52 55.5	590.8	68.83	15 40.5	57 25.9	
12	U	19 24.56	2.184	2 47 49.89	141.27	+20 42 24.5	+502.7	69.25	15 35.0	57 5.8	II. N.
13	L	7 50.93	2.210	3 16 14.58	142.80	22 13 35.8	408.1	69.61	15 29.8	56 46.5	
13	U	20 17.56	2.229	3 44 55.41	143.93	23 25 19.1	308.3	69.87	15 24.7	56 28.0	II. N.
14	L	8 44.37	2.238	4 13 46.64	144.50	24 16 42.8	205.2	69.98	15 20.0	56 10.5	
14	U	21 11.23	2.236	4 42 40.76	144.39	+24 47 17.5	+100.6	69.92	15 15.5	55 54.0	II. N.
15	L	9 37.99	2.222	5 11 29.11	143.54	24 56 58.0	-3.5	69.68	15 11.3	55 38.5	
15	U	22 4.51	2.196	5 40 2.71	141.95	24 46 3.7	104.9	69.24	15 7.3	55 23.9	II. S.
16	L	10 30.64	2.158	6 8 12.97	139.67	24 15 18.4	201.7	68.64	15 3.6	55 10.4	
16	U	22 56.25	2.111	6 35 52.50	136.84	+23 25 46.8	-292.3	67.89	15 0.2	54 57.9	II. S.
17	L	11 21.27	2.067	7 2 55.63	133.62	22 18 50.4	375.7	67.05	14 57.1	54 46.4	
17	U	23 45.61	2.000	7 29 18.63	130.18	20 56 2.9	450.9	66.13	14 54.2	54 36.0	
18	L	12 9.26	1.942	7 54 59.87	126.69	19 19 4.8	517.4	65.21	14 51.7	54 26.7	
19	U	0 32.22	1.885	8 19 59.61	123.29	+17 29 39.9	-575.3	64.30	14 49.5	54 18.6	
19	L	12 54.53	1.833	8 44 19.82	120.12	15 29 30.5	624.9	63.45	14 47.6	54 11.8	
20	U	1 16.23	1.786	9 8 3.84	117.28	13 20 16.1	666.2	62.70	14 46.2	54 6.4	I. N.
20	L	13 37.41	1.745	9 31 16.15	114.85	11 3 31.2	700.1	62.04	14 45.1	54 2.5	
21	U	1 58.14	1.712	9 54 2.02	112.88	+8 40 45.0	-726.5	61.52	14 44.5	54 0.2	I. N.
21	L	14 18.54	1.688	10 16 27.40	111.43	6 13 20.3	746.4	61.14	14 44.3	53 59.6	
22	U	2 38.70	1.673	10 38 38.70	110.54	3 42 36.2	759.9	60.92	14 44.7	54 0.9	I. N.
22	L	14 58.74	1.668	11 0 42.73	110.23	+1 9 46.7	767.4	60.86	14 45.6	54 4.2	
23	U	3 18.78	1.673	11 22 46.58	110.52	-1 23 55.4	-768.7	60.96	14 47.1	54 9.7	I. N.
23	L	15 38.94	1.688	11 44 57.58	111.43	3 57 19.3	764.2	61.25	14 49.2	54 17.4	
24	U	3 59.34	1.714	12 7 23.33	112.97	6 29 12.6	753.6	61.72	14 51.9	54 27.5	I. N.
24	L	16 20.11	1.750	12 30 11.50	115.17	8 58 19.2	736.4	62.36	14 55.3	54 40.0	
25	U	4 41.39	1.798	12 53 29.96	118.02	-11 23 17.3	-712.1	63.17	14 59.4	54 55.0	I. N.

July 2, U Defective Illumination of N. 0°.01.

July 3, U Defective Illumination of N. 0°.36.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
July 25	U	4 41.39	1.798	12 53 29.96	118.02	-11 23 17.3	-712.1	63.17	14 59.4	54 55.0	I. N.
25	L	17 3.30	1.856	13 17 26.47	121.50	13 42 37.9	680.0	64.14	15 4.2	55 12.5	
26	U	5 25.97	1.924	13 42 8.57	125.61	15 54 41.2	639.0	65.26	15 9.6	55 32.5	I. N.
26	L	17 49.51	2.001	14 7 43.22	130.26	17 57 34.9	588.3	66.50	15 15.7	55 54.8	
27	U	6 14.03	2.066	14 34 16.39	135.34	-19 49 14.4	-526.5	67.82	15 22.4	56 19.3	I. N.
27	L	18 39.59	2.175	15 1 52.48	140.70	21 27 21.4	452.6	69.19	15 29.6	56 45.7	
28	U	7 6.23	2.265	15 30 33.56	146.13	22 49 27.0	366.2	70.54	15 37.2	57 13.7	I. N.
28	L	19 33.93	2.352	16 0 18.72	151.84	23 52 56.8	266.7	71.81	15 45.2	57 43.0	
29	U	8 2.63	2.429	16 31 3.44	156.01	-24 35 18.4	-154.9	72.92	15 53.3	58 12.9	I. N.
29	L	20 32.17	2.492	17 2 39.26	159.79	24 54 12.4	-32.5	73.81	16 1.5	58 42.9	
30	U	9 2.36	2.536	17 34 54.00	162.45	24 47 46.4	+ 97.9	74.41	16 9.5	59 12.3	I. N.S.
30	L	21 32.96	2.558	18 7 32.75	163.78	24 14 47.2	232.3	74.69	16 17.1	59 40.2	
31	U	10 3.67	2.558	18 40 19.17	163.73	-23 14 51.8	+366.4	74.65	16 24.1	60 5.9	I. N.S.
31	L	22 34.26	2.536	19 12 57.38	162.44	21 48 33.9	495.3	74.32	16 30.3	60 28.6	
Aug. 1	U	11 4.47	2.498	19 45 13.59	160.12	19 57 23.7	614.4	73.75	16 35.5	60 47.5	I. N.S.
1	L	23 34.15	2.447	20 16 57.39	157.09	17 43 41.3	720.1	73.00	16 39.4	61 2.0	
2	U	12 3.18	2.391	20 48 2.27	153.09	-15 10 27.5	+809.3	72.17	16 42.0	61 11.6	I. II. N.S.
3	L	0 31.52	2.333	21 18 25.78	150.24	12 21 11.4	880.2	71.32	16 43.2	61 16.0	
3	U	12 59.19	2.279	21 48 8.86	147.00	9 19 38.2	932.1	70.53	16 43.0	61 15.2	II. N.
4	L	1 26.25	2.232	22 17 15.25	144.16	6 9 38.9	964.7	69.84	16 41.4	61 9.2	
4	U	13 52.80	2.194	22 45 50.64	141.86	-2 55 0.6	+978.7	69.27	16 38.4	60 58.3	II. N.
5	L	2 18.95	2.166	23 14 1.92	140.15	+ 0 20 39.0	975.1	68.86	16 34.2	60 43.1	
5	U	14 44.82	2.148	23 41 56.58	139.07	3 33 55.7	955.1	68.62	16 29.1	60 24.2	II. N.
6	L	3 10.53	2.140	0 9 42.11	138.62	6 41 41.8	920.2	68.53	16 23.1	60 2.3	
6	U	15 36.21	2.142	0 37 25.54	138.71	+ 9 41 6.1	+871.7	68.58	16 16.5	59 38.0	II. N.
7	L	4 1.97	2.161	1 5 13.14	139.29	12 29 34.8	811.1	68.76	16 9.5	59 12.1	
7	U	16 27.87	2.167	1 33 9.90	140.22	15 4 50.6	739.8	69.02	16 2.2	58 45.3	II. N.
8	L	4 53.98	2.186	2 1 19.29	141.37	17 24 52.6	659.1	69.33	15 54.8	58 18.2	
8	U	17 20.33	2.206	2 29 43.00	142.58	+19 27 56.2	+570.3	69.64	15 47.4	57 51.3	II. N.
9	L	5 46.92	2.224	2 58 20.71	143.67	21 12 34.1	475.0	69.92	15 40.3	57 25.1	
9	U	18 13.70	2.238	3 27 10.02	144.49	22 37 36.8	374.7	70.12	15 33.4	56 59.9	II. N.
10	L	6 40.59	2.244	3 56 6.53	144.86	23 42 14.4	271.1	70.20	15 26.9	56 36.1	
10	U	19 7.51	2.241	4 25 4.25	144.66	+24 25 58.6	+166.1	70.14	15 20.9	56 13.8	II. N.
11	L	7 34.33	2.227	4 53 55.94	143.84	24 48 43.1	+ 61.5	69.91	15 15.3	55 53.2	
11	U	20 0.92	2.203	5 22 33.85	142.38	24 50 44.5	- 40.8	69.50	15 10.1	55 34.3	II. N.
12	L	8 27.15	2.168	5 50 50.41	140.29	24 32 39.8	139.2	68.94	15 5.4	55 17.2	
12	U	20 52.91	2.125	6 18 38.78	137.70	+23 55 25.7	-232.2	68.25	15 1.3	55 1.9	II. S.
13	L	9 18.12	2.075	6 45 53.52	134.71	23 0 14.1	318.6	67.44	14 57.6	54 48.3	
13	U	21 42.70	2.021	7 12 30.78	131.47	21 48 28.7	397.7	66.56	14 54.3	54 36.4	II. S.
14	L	10 6.63	1.966	7 38 28.46	128.14	20 21 41.3	468.9	65.65	14 51.5	54 26.1	
14	U	22 29.89	1.911	8 3 46.24	124.84	+18 41 27.8	-532.1	64.74	14 49.1	54 17.4	II. S.
15	L	10 52.50	1.869	8 28 25.34	121.71	16 49 25.6	587.0	63.88	14 47.2	54 10.2	
15	U	23 14.52	1.811	8 52 28.28	118.83	14 47 10.5	634.2	63.08	14 45.6	54 4.4	
16	L	11 36.00	1.769	9 15 58.70	116.30	12 36 16.5	673.6	62.37	14 44.4	54 0.0	
16	U	23 57.01	1.734	9 39 1.08	114.18	+10 18 13.8	-705.7	61.77	14 43.6	53 57.1	

July 31, U Defective Illumination of N. 1".00.

Aug. 1, U Defective Illumination of N. 0".56.

Aug. 2, U Defective Illumination of II. 0".00.

Aug. 2, U Defective Illumination of S. 0".30.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Aug. 16	U	23 57.01	1.734	9 39 1.08	114.18	+10 18 13.8	-705.7	61.77	14 43.6	53 57.1	
17	L	12 17.64	1.706	10 1 40.57	112.49	7 54 29.0	730.7	61.30	14 43.2	53 55.6	
18	U	0 37.98	1.686	10 24 2.77	111.29	5 26 25.5	748.8	60.97	14 43.2	53 55.5	
18	L	12 58.14	1.675	10 46 13.63	110.61	2 55 22.9	760.4	60.79	14 43.6	53 56.9	
19	U	1 18.21	1.672	11 8 19.45	110.45	+ 0 22 39.2	-765.7	60.77	14 44.4	53 59.8	I. N.
19	L	13 38.30	1.678	11 30 26.67	110.84	- 2 10 29.2	764.6	60.90	14 45.6	54 4.3	
20	U	1 58.53	1.664	11 52 41.92	111.80	4 42 45.7	757.0	61.20	14 47.3	54 10.5	I. N.
20	L	14 19.00	1.719	12 15 11.98	113.31	7 12 52.4	742.9	61.65	14 49.5	54 18.5	
21	U	2 39.84	1.754	12 38 3.65	115.40	- 9 39 28.8	-721.9	62.26	14 52.2	54 28.4	I. N.
21	L	15 1.14	1.798	13 1 23.74	118.05	12 1 10.8	693.7	63.03	14 55.4	54 40.2	
22	U	3 23.03	1.851	13 25 18.92	121.24	14 16 27.3	657.7	63.93	14 59.1	54 54.0	I. N.
22	L	15 45.61	1.913	13 49 55.51	124.94	16 23 40.7	613.1	64.96	15 3.5	55 9.9	
23	U	4 8.97	1.982	14 15 19.18	129.08	-18 21 5.0	-559.3	66.09	15 8.4	55 28.0	I. N.
23	L	16 33.19	2.056	14 41 34.71	133.56	20 6 45.4	495.6	67.29	15 13.9	55 48.2	
24	U	4 58.32	2.134	15 8 45.32	138.23	21 38 39.1	421.5	68.51	15 19.9	56 10.4	I. N.
24	L	17 24.40	2.212	15 36 52.40	142.94	22 54 37.4	336.4	69.72	15 26.5	56 34.6	
25	U	5 51.40	2.287	16 5 54.89	147.43	-23 52 29.4	-240.4	70.85	15 33.6	57 0.5	I. N.
25	L	18 19.25	2.354	16 35 48.86	151.47	24 30 7.4	134.2	71.85	15 41.1	57 28.0	
26	U	6 47.84	2.409	17 6 27.42	154.82	24 45 35.6	- 19.2	72.66	15 48.9	57 56.6	I. N.
26	L	19 17.02	2.450	17 37 41.01	157.27	24 37 19.7	+102.7	73.24	15 56.9	58 25.8	
27	U	7 46.58	2.474	18 9 17.98	158.70	-24 4 14.4	+228.5	73.55	16 4.8	58 55.1	I. N.S.
27	L	20 16.32	2.480	18 41 5.66	159.07	23 5 53.3	354.8	73.60	16 12.6	59 23.8	
28	U	8 46.04	2.470	19 12 51.64	158.44	21 42 32.7	477.8	73.42	16 20.1	59 51.2	I. S.
28	L	21 15.54	2.446	19 44 24.97	156.99	19 55 15.2	593.7	73.04	16 27.0	60 16.6	
29	U	9 44.69	2.412	20 15 37.18	154.96	-17 45 45.8	+699.2	72.51	16 33.1	60 39.0	I. S.
29	L	22 13.40	2.373	20 46 22.76	152.61	15 16 29.0	791.1	71.91	16 38.2	60 57.7	
30	U	10 41.63	2.332	21 16 39.34	150.17	12 30 21.0	867.3	71.28	16 42.1	61 12.0	I. S.
30	L	23 9.38	2.294	21 46 27.40	147.88	9 30 42.2	926.0	70.70	16 44.7	61 21.4	
31	U	11 36.71	2.262	22 15 49.78	145.92	- 6 21 8.9	+966.3	70.20	16 45.8	61 25.5	I. N.S.
Sept. 1	L	0 3.69	2.236	22 44 51.16	144.39	- 3 5 26.7	987.5	69.82	16 45.4	61 24.2	
1	U	12 30.41	2.219	23 13 37.26	143.38	+ 0 12 37.0	990.0	69.57	16 43.6	61 17.3	II. N.
2	L	0 56.99	2.211	23 42 14.46	142.91	3 29 19.0	974.0	69.46	16 40.3	61 5.3	
2	U	13 23.52	2.212	0 10 49.05	142.95	+ 6 41 5.4	+940.8	69.49	16 35.7	60 48.5	II. N.
3	L	1 50.11	2.220	0 39 26.86	143.43	9 44 35.3	991.6	69.63	16 30.0	60 27.6	
3	U	14 16.83	2.234	1 8 12.69	144.26	12 36 44.5	827.7	69.87	16 23.4	60 3.3	II. N.
4	L	2 43.74	2.251	1 37 9.98	145.31	15 14 48.4	750.9	70.17	16 16.1	59 36.4	
4	U	15 10.86	2.270	2 6 20.43	146.42	+17 36 24.3	+663.3	70.48	16 8.3	59 7.7	II. N.
5	L	3 38.21	2.287	2 35 43.71	147.43	19 39 32.9	566.8	70.76	16 0.2	58 38.0	
5	U	16 5.72	2.298	3 5 17.38	148.13	21 22 40.6	463.6	70.96	15 52.0	58 8.0	II. N.
6	L	4 33.33	2.302	3 34 56.99	148.38	22 44 40.6	355.9	71.04	15 43.9	57 38.3	
6	U	17 0.94	2.297	4 4 36.30	148.06	+23 44 54.0	+246.1	70.98	15 36.1	57 9.6	II. N.
7	L	5 28.42	2.281	4 34 7.85	147.09	24 23 9.5	136.6	70.75	15 28.6	56 42.2	
7	U	17 55.64	2.254	5 3 23.71	145.44	24 39 42.3	+ 29.4	70.34	15 21.6	56 16.5	II. N.
8	L	6 22.47	2.216	5 32 16.01	143.18	24 35 11.3	- 73.7	69.77	15 15.2	55 52.8	
8	U	18 48.79	2.169	6 0 37.79	140.38	+24 10 36.5	-171.1	69.04	15 9.3	55 31.3	II. S.

Aug. 27, U Defective Illumination of N. 0' 29.

Aug. 31, U Defective Illumination of S. 0' 22.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Sept. 8	U	18 48.79	2.169	6 03 77.9	140.38	+24 10 36.5	-171.1	69.04	15 9.3	55 31.3	II. S.
9	L	7 14.51	2.116	6 28 23.47	137.18	23 27 12.8	261.7	68.20	15 4.0	55 12.0	
9	U	19 39.56	2.059	6 55 29.20	133.74	22 26 26.5	344.7	67.28	14 59.4	54 55.0	II. S.
10	L	8 3.92	2.001	7 21 52.96	130.22	21 9 50.9	419.9	66.33	14 55.4	54 40.4	
10	U	20 27.58	1.943	7 47 34.51	126.73	+19 39 2.0	-486.9	65.37	14 52.1	54 28.1	II. S.
11	L	8 50.55	1.888	8 12 35.17	123.42	17 55 35.8	546.1	64.45	14 49.3	54 18.0	
11	U	21 12.89	1.837	8 36 57.62	120.38	16 1 6.1	597.5	63.59	14 47.1	54 10.0	II. S.
12	L	9 34.66	1.792	9 0 45.59	117.68	13 57 3.9	641.6	62.81	14 45.5	54 3.9	
12	U	21 55.93	1.754	9 24 3.60	115.39	+11 44 56.6	-678.4	62.15	14 44.4	53 59.8	II. S.
13	L	10 16.79	1.724	9 46 56.80	113.55	9 26 8.3	708.5	61.60	14 43.7	53 57.5	
13	U	22 37.33	1.701	10 9 30.72	112.18	7 2 0.1	731.9	61.19	14 43.5	53 56.8	II. S.
14	L	10 57.65	1.686	10 31 51.21	111.31	4 33 51.2	748.6	60.92	14 43.8	53 57.7	
14	U	23 17.84	1.680	10 54 4.29	110.96	+ 2 259.3	-750.0	60.81	14 44.4	54 0.0	
15	L	11 38.01	1.683	11 16 16.18	111.12	- 0 29 17.5	762.8	60.85	14 45.4	54 3.7	
15	U	23 58.26	1.694	11 38 33.09	111.79	3 140.9	759.9	61.04	14 46.8	54 8.8	
16	L	12 18.71	1.714	12 1 1.31	113.00	5 32 50.3	750.4	61.39	14 48.6	54 15.2	
17	U	0 39.44	1.743	12 23 47.07	114.72	- 8 1 22.4	-733.7	61.88	14 50.7	54 22.9	
17	L	13 0.57	1.780	12 46 56.50	116.94	10 25 49.7	709.5	62.51	14 53.1	54 31.8	
18	U	1 22.19	1.825	13 10 35.57	119.65	12 44 40.2	677.4	63.27	14 55.9	54 42.1	I. N.
18	L	13 44.39	1.877	13 34 49.78	122.79	14 56 16.8	637.1	64.14	14 59.0	54 53.7	
19	U	2 7.26	1.936	13 59 44.06	126.32	-16 58 56.4	-587.9	65.12	15 2.6	55 6.7	I. N.
19	L	14 30.87	1.999	14 25 22.50	130.14	18 50 50.8	529.5	66.16	15 6.5	55 21.1	
20	U	2 55.26	2.066	14 51 47.95	134.13	20 30 6.8	461.5	67.24	15 10.8	55 37.0	I. N.
20	L	15 20.45	2.133	15 19 1.73	138.16	21 54 48.4	383.8	68.32	15 15.6	55 54.4	
21	U	3 46.43	2.197	15 47 3.20	142.05	-23 3 0.1	-266.6	69.34	15 20.7	56 13.2	I. N.
21	L	16 13.16	2.256	16 15 49.59	145.61	23 52 50.6	200.4	70.26	15 26.2	56 33.5	
22	U	4 40.55	2.307	16 45 15.79	148.66	24 22 38.3	- 96.3	71.04	15 32.1	56 55.2	I. N.
22	L	17 8.48	2.346	17 15 14.56	151.02	24 30 56.8	+ 14.2	71.64	15 38.4	57 18.1	
23	U	5 36.80	2.372	17 45 37.00	152.59	-24 16 42.2	+128.9	72.03	15 44.9	57 42.1	I. N.
23	L	18 5.36	2.384	18 16 13.21	153.31	23 39 17.2	245.4	72.21	15 51.7	58 6.8	
24	U	6 33.97	2.383	18 46 53.19	153.22	22 38 35.5	361.1	72.18	15 58.5	58 31.9	I. S.
24	L	19 2.50	2.370	19 17 27.83	152.44	21 15 4.2	473.3	71.97	16 5.3	58 57.0	
25	U	7 30.82	2.348	19 47 49.67	151.13	-19 29 41.8	+579.1	71.63	16 12.0	59 21.6	I. S.
25	L	19 58.83	2.321	20 17 53.46	149.47	17 23 59.1	676.3	71.19	16 18.4	59 45.0	
26	U	8 26.50	2.291	20 47 36.47	147.70	14 59 54.3	762.5	70.72	16 24.3	60 6.6	I. S.
26	L	20 53.82	2.263	21 16 58.40	145.99	12 19 49.7	835.9	70.26	16 29.5	60 25.7	
27	U	9 20.82	2.238	21 46 1.14	144.52	- 9 26 28.7	+895.0	69.87	16 33.9	60 41.7	I. S.
27	L	21 47.57	2.220	22 14 48.45	143.44	6 22 51.9	938.4	69.56	16 37.2	60 53.9	
28	U	10 14.14	2.210	22 43 25.40	142.81	- 3 12 13.8	965.0	69.38	16 39.4	61 1.8	I. S.
28	L	22 40.64	2.208	23 11 57.91	142.70	+ 0 2 0.9	974.3	69.32	16 40.2	61 5.0	
29	U	11 7.16	2.215	23 40 32.23	143.11	+ 3 16 20.9	+965.9	69.41	16 39.8	61 3.3	I. N.S.
29	L	23 33.82	2.230	0 9 14.47	144.01	6 27 12.2	939.6	69.63	16 37.9	60 56.6	
30	U	12 0.70	2.252	0 38 10.06	145.32	9 31 4.2	896.1	69.96	16 34.8	60 45.0	I. II. N.
Oct. 1	L	0 27.88	2.278	1 7 23.27	146.92	12 24 33.2	836.0	70.37	16 30.4	60 29.0	
1	U	12 55.39	2.307	1 36 56.62	148.65	+15 4 28.5	+760.8	70.81	16 24.9	60 8.9	II. N.

Sept. 30, U Defective Illumination of I. 0.06.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Oct. 1	U	12 55.39	2.307	1 36 56.62	148.65	+15 42 28.5	+780.8	70.81	16 24.9	60 8.9	II. N.
2	L	1 23.24	2.335	2 6 50.57	180.31	17 27 58.9	672.2	71.24	16 18.5	59 45.4	
2	U	13 51.40	2.358	2 37 3.14	161.71	19 32 37.3	572.6	71.61	16 11.4	59 19.3	II. N.
3	L	2 19.80	2.373	3 7 29.78	152.63	21 16 26.5	464.5	71.87	16 3.8	58 51.2	
3	U	14 48.31	2.377	3 38 3.62	152.89	+22 38 3.3	+350.9	71.97	15 55.8	58 21.9	II. N.
4	L	3 16.80	2.368	4 8 35.89	152.35	23 36 40.8	235.1	71.87	15 47.7	57 52.3	
4	U	15 45.10	2.345	4 38 56.67	150.97	24 12 9.2	120.0	71.56	15 39.7	57 22.9	II. N.
5	L	4 13.04	2.309	5 8 55.93	148.78	24 24 52.9	+ 8.2	71.04	15 31.9	56 54.4	
5	U	16 40.47	2.261	5 38 24.35	145.86	+24 15 46.5	- 98.1	70.34	15 24.5	56 27.3	II. N. S.
6	L	5 7.25	2.203	6 7 14.25	142.38	23 46 8.3	197.0	69.48	15 17.6	56 1.9	
6	U	17 33.30	2.139	6 35 19.95	138.53	22 57 32.9	287.5	68.52	15 11.3	55 38.7	II. S.
7	L	5 58.57	2.072	7 2 38.20	134.50	21 51 44.6	369.0	67.48	15 5.6	55 17.8	
7	U	18 23.03	2.005	7 29 7.95	120.46	+20 30 31.5	-441.6	66.43	15 0.6	54 59.4	II. S.
8	L	6 46.69	1.941	7 54 50.22	126.61	18 55 40.4	505.4	65.39	14 56.3	54 43.7	
8	U	19 9.62	1.881	8 19 47.74	123.03	17 8 53.7	560.9	64.41	14 52.7	54 30.5	II. S.
9	L	7 31.87	1.828	8 44 4.56	119.84	15 11 48.3	608.6	63.52	14 49.9	54 20.0	
9	U	19 53.52	1.782	9 7 45.69	117.10	+13 5 54.7	-649.0	62.74	14 47.7	54 12.1	II. S.
10	L	8 14.68	1.745	9 30 56.81	114.84	10 52 36.9	682.7	62.08	14 46.2	54 6.7	
10	U	20 35.44	1.716	9 53 44.08	113.12	8 33 14.4	710.0	61.57	14 45.4	54 3.6	II. S.
11	L	8 55.91	1.697	10 16 13.91	111.94	6 9 2.4	731.0	61.20	14 45.2	54 2.8	
11	U	21 16.20	1.686	10 38 32.89	111.31	+ 3 41 14.6	-746.0	60.98	14 45.5	54 4.0	II. S.
12	L	9 36.42	1.685	11 0 47.66	111.24	+ 1 11 3.5	754.8	60.93	14 46.4	54 7.2	
12	U	21 56.68	1.693	11 23 4.92	111.73	- 1 20 16.9	757.5	61.03	14 47.7	54 12.2	II. S.
13	L	10 17.09	1.710	11 45 31.25	112.76	3 51 30.2	753.7	61.30	14 49.5	54 18.7	
13	U	22 37.76	1.736	12 8 13.24	114.33	- 6 21 16.1	-742.8	61.71	14 51.7	54 26.7	II. S.
14	L	10 58.80	1.771	12 31 17.25	116.42	8 48 8.7	724.6	62.27	14 54.2	54 35.9	
14	U	23 20.30	1.814	12 54 49.35	119.01	11 10 35.9	698.4	62.97	14 57.0	54 46.2	
15	L	11 42.37	1.865	13 18 55.19	122.04	13 26 58.7	663.9	63.79	15 0.1	54 57.5	
16	U	0 5.08	1.921	13 43 39.76	125.45	-15 35 31.5	-620.1	64.71	15 3.4	55 9.7	
16	L	12 28.50	1.983	14 9 7.14	129.15	17 34 21.7	566.7	65.69	15 6.9	55 22.7	
17	U	0 52.68	2.047	14 35 20.09	133.02	19 21 32.0	503.4	66.72	15 10.6	55 36.3	I. N.
17	L	13 17.63	2.112	15 2 19.82	136.92	20 55 2.5	430.1	67.75	15 14.5	55 50.5	
18	U	1 43.35	2.174	15 30 5.47	140.65	-22 12 53.7	-346.9	68.74	15 18.6	56 5.3	I. N.
18	L	14 9.79	2.230	15 58 34.04	144.04	23 13 12.2	254.7	69.62	15 22.8	56 20.7	
19	U	2 36.84	2.278	16 27 40.20	146.89	23 54 16.1	154.7	70.36	15 27.1	56 36.7	I. N.
19	L	15 4.40	2.314	16 57 16.48	149.04	24 14 40.5	- 48.5	70.93	15 31.6	56 53.1	
20	U	3 32.31	2.336	17 27 13.76	150.37	-24 13 23.7	+ 61.8	71.30	15 36.2	57 10.1	I. N.
20	L	16 0.40	2.344	17 57 22.03	150.86	23 49 51.3	173.7	71.45	15 40.9	57 27.4	
21	U	4 28.50	2.338	18 27 31.19	150.53	23 3 58.7	284.7	71.39	15 45.8	57 45.2	I. S.
21	L	16 56.47	2.321	18 57 32.09	149.51	21 56 11.4	392.4	71.16	15 50.7	58 3.2	
22	U	5 24.18	2.295	19 27 17.31	147.95	-20 27 23.7	+494.4	70.79	15 55.6	58 21.3	I. S.
22	L	17 51.54	2.264	19 56 41.65	146.06	18 38 54.2	589.1	70.32	16 0.5	58 39.3	
23	U	6 18.50	2.220	20 25 42.40	144.05	16 32 22.9	674.6	69.82	16 5.3	58 57.0	I. S.
23	L	18 45.07	2.198	20 54 19.35	142.13	14 9 47.4	749.6	69.32	16 9.9	59 13.9	
24	U	7 11.28	2.171	21 22 34.56	140.46	-11 33 18.3	+813.2	68.88	16 14.3	59 29.8	I. S.

Oct. 5, U Defective Illumination of S. 0''.66.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi-d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	"	"	"	
Oct. 24	U	7 11.28	2.171	21 22 34.56	140.46	-11 33 18.3	+813.2	68.88	16 14.3	59 29.8	I. S.
24	L	19 37.20	2.160	21 50 31.96	139.18	8 45 18.3	864.6	68.53	16 18.2	59 44.2	
25	U	8 2.91	2.137	22 18 16.95	138.41	5 48 19.9	902.8	68.30	16 21.6	59 56.7	I. S.
25	L	20 28.52	2.133	22 45 55.98	138.20	- 2 45 5.3	927.2	68.22	16 24.4	60 6.8	
26	U	8 54.14	2.140	23 13 36.08	138.59	+ 0 21 34.7	+936.9	68.29	16 26.4	60 14.1	I. S.
26	L	21 19.91	2.156	23 41 24.50	139.58	3 28 40.5	931.4	68.51	16 27.5	60 18.2	
27	U	9 45.93	2.182	0 9 28.21	141.13	6 33 6.1	910.1	68.87	16 27.6	60 18.8	I. S.
27	L	22 12.30	2.216	0 37 53.42	143.15	9 31 39.9	872.8	69.36	16 26.8	60 15.6	
28	U	10 39.12	2.255	1 6 45.14	145.51	+12 21 8.8	+819.3	69.93	16 24.9	60 8.6	I. N.S.
28	L	23 6.43	2.297	1 36 6.50	148.05	14 58 22.2	750.3	70.55	16 21.9	59 57.8	
29	U	11 34.25	2.338	2 5 58.31	150.55	17 20 18.8	666.8	71.16	16 18.0	59 43.3	I. II. N.
30	L	0 2.54	2.375	2 36 18.63	152.76	19 24 14.2	570.4	71.70	16 13.1	59 25.5	
30	U	12 31.22	2.403	3 7 2.39	154.42	+21 7 48.4	+463.8	72.12	16 7.5	59 4.9	II. N.
31	L	1 0.15	2.417	3 38 1.58	155.20	22 29 13.8	349.5	72.34	16 1.2	58 41.9	
31	U	13 29.17	2.416	4 9 5.76	155.23	23 27 21.2	231.3	72.35	15 54.5	58 17.1	II. N.
Nov. 1	L	1 58.07	2.398	4 40 2.87	154.12	24 1 43.8	+112.7	72.11	15 47.4	57 51.2	
1	U	14 26.65	2.362	5 10 40.45	151.98	+24 12 36.8	- 3.1	71.63	15 40.2	57 24.8	II. N.
2	L	2 54.71	2.312	5 40 46.83	148.94	24 0 53.1	113.1	70.92	15 33.1	56 58.5	
2	U	15 22.09	2.249	6 10 12.28	145.20	23 27 56.5	214.9	70.02	15 26.1	56 32.9	II. N.S.
3	L	3 48.67	2.179	6 38 49.62	140.97	22 35 32.7	307.4	68.99	15 19.4	56 8.5	
3	U	16 14.37	2.105	7 6 34.65	136.52	+21 25 39.7	-389.7	67.88	15 13.2	55 45.7	II. S.
4	L	4 39.19	2.031	7 33 25.93	132.05	20 0 20.3	461.8	66.75	15 7.5	55 24.9	
4	U	17 3.13	1.960	7 59 24.52	127.77	18 21 35.1	524.1	65.64	15 2.5	55 6.3	II. S.
5	L	5 26.24	1.894	8 24 33.55	123.81	16 31 18.4	577.2	64.60	14 58.1	54 50.1	
5	U	17 48.61	1.836	8 48 57.69	120.29	+14 31 15.4	-621.9	63.65	14 54.4	54 36.6	II. S.
6	L	6 10.33	1.786	9 12 42.69	117.39	12 23 2.6	659.0	62.83	14 51.5	54 25.9	
6	U	18 31.51	1.745	9 35 55.06	114.86	10 8 7.0	689.1	62.15	14 49.3	54 17.9	II. S.
7	L	6 52.26	1.715	9 58 41.77	113.02	7 47 48.0	713.0	61.61	14 47.8	54 12.6	
7	U	19 12.71	1.694	10 21 10.06	111.80	+ 5 23 18.8	-730.9	61.25	14 47.2	54 10.2	II. S.
8	L	7 32.97	1.684	10 43 27.32	111.19	2 55 49.1	743.1	61.06	14 47.3	54 10.4	
8	U	19 53.17	1.684	11 5 40.97	111.20	+ 0 26 26.3	749.7	61.03	14 48.0	54 13.1	II. S.
9	L	8 13.43	1.695	11 27 58.46	111.82	- 2 3 41.3	750.6	61.17	14 49.4	54 18.2	
9	U	20 33.88	1.716	11 50 27.17	113.06	- 4 33 23.0	-745.3	61.48	14 51.4	54 25.5	II. S.
10	L	8 54.64	1.746	12 13 14.35	114.90	7 1 22.8	733.6	61.96	14 53.9	54 34.9	
10	U	21 15.82	1.796	12 36 27.09	117.32	9 26 18.4	714.5	62.60	14 57.0	54 46.1	II. S.
11	L	9 37.54	1.836	13 0 12.13	120.27	11 46 39.4	687.5	63.37	15 0.4	54 58.9	
11	U	21 59.90	1.892	13 24 35.64	123.72	-14 0 45.3	-651.9	64.27	15 4.3	55 12.9	II. S.
12	L	10 22.99	1.957	13 49 43.03	127.58	16 6 46.3	606.5	65.27	15 8.4	55 28.0	
12	U	22 46.88	2.026	14 15 38.50	131.72	18 2 43.0	551.0	66.34	15 12.7	55 43.9	
13	L	11 11.61	2.097	14 42 24.71	136.00	19 46 28.2	484.7	67.43	15 17.2	56 0.2	
13	U	23 37.19	2.167	15 10 2.14	140.22	-21 15 51.2	-407.4	68.50	15 21.7	56 16.8	
14	L	12 3.60	2.233	15 38 28.92	144.17	22 28 41.8	319.3	69.50	15 26.2	56 33.3	
15	U	0 30.74	2.290	16 7 40.32	147.62	23 22 57.7	221.7	70.36	15 30.6	56 49.7	
15	L	12 58.50	2.335	16 37 28.81	150.33	23 56 52.1	116.1	71.05	15 35.0	57 5.6	
16	U	1 26.71	2.365	17 7 44.55	152.13	-24 9 2.2	- 4.9	71.52	15 39.2	57 20.9	I. N.

Oct. 28, U Defective Illumination of N. 0°.35.
Oct. 29, U Defective Illumination of II. 0°.04.

Nov. 2, U Defective Illumination of N. 0°.08.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocen- tric Semidiameter.	Equa- torial Horiz- ontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 16	U	1 26.71	2.365	17 7 44.55	152.13	-24 9 2.2	- 4.9	71.52	15 39.2	57 20.9	I. N.
16	L	13 55.19	2.378	17 38 15.87	152.92	23 58 36.1	+109.4	71.74	15 43.2	57 35.6	
17	U	2 23.72	2.374	18 8 50.55	152.70	23 25 17.1	223.5	71.72	15 47.0	57 49.6	I. S.
17	L	14 52.11	2.355	18 39 16.86	151.55	22 29 25.1	334.5	71.47	15 50.6	58 2.7	
18	U	3 20.19	2.324	19 9 24.74	149.66	-21 11 55.1	+439.4	71.04	15 53.9	58 14.9	I. S.
18	L	15 47.84	2.284	19 39 6.60	147.26	19 34 11.8	536.3	70.48	15 57.0	58 26.4	
19	U	4 14.98	2.239	20 8 17.76	144.58	17 38 3.4	623.3	69.84	15 59.9	58 37.0	I. S.
19	L	16 41.58	2.194	20 36 56.51	141.89	15 25 34.8	699.5	69.19	16 2.5	58 46.7	
20	U	5 7.66	2.153	21 5 3.90	139.38	-12 59 1.9	+764.0	68.57	16 4.9	58 55.5	I. S.
20	L	17 33.28	2.118	21 32 43.35	137.25	10 20 46.7	816.5	68.04	16 7.1	59 3.5	
21	U	5 58.52	2.091	22 0 0.06	135.62	7 33 14.3	856.8	67.62	16 9.0	59 10.4	I. S.
21	L	18 23.49	2.073	22 27 0.63	134.59	4 38 52.0	884.9	67.35	16 10.6	59 16.2	
22	U	6 48.31	2.067	22 53 52.60	134.19	- 1 40 8.8	+900.3	67.23	16 11.8	59 20.8	I. S.
22	L	19 13.13	2.072	23 20 43.91	134.48	+ 1 20 24.9	903.1	67.29	16 12.7	59 24.1	
23	U	7 38.07	2.087	23 47 42.69	135.43	4 20 14.4	892.9	67.52	16 13.2	59 25.7	I. S.
23	L	20 3.26	2.113	0 14 56.79	137.01	7 16 41.7	869.3	67.89	16 13.1	59 25.5	
24	U	8 28.83	2.149	0 42 33.32	139.16	+10 7 4.9	+832.2	68.40	16 12.5	59 23.3	I. S.
24	L	20 54.87	2.192	1 10 38.25	141.74	12 48 38.6	781.1	69.02	16 11.3	59 19.0	
25	U	9 21.45	2.229	1 39 15.89	144.58	15 18 35.9	716.2	69.71	16 9.6	59 12.5	I. S.
25	L	21 48.61	2.287	2 8 28.27	147.48	17 34 13.2	637.9	70.40	16 7.1	59 3.6	
26	U	10 16.34	2.333	2 38 14.70	150.20	+19 32 55.0	+547.1	71.05	16 4.1	58 52.3	I. S.
26	L	22 44.57	2.370	3 8 31.38	152.48	21 12 22.0	445.7	71.59	16 0.4	58 38.8	
27	U	11 13.19	2.396	3 39 11.24	154.03	22 30 38.9	335.9	71.95	15 56.1	58 23.1	I. N.S.
27	L	23 42.02	2.407	4 10 4.34	154.65	23 26 22.9	220.7	72.09	15 51.3	58 5.5	
28	U	12 10.87	2.399	4 40 58.57	154.20	+23 58 49.5	+103.6	71.99	15 46.1	57 46.4	II. N.S.
29	L	0 39.53	2.373	5 11 40.78	152.65	24 7 55.8	- 12.0	71.62	15 40.6	57 26.0	
29	U	13 7.77	2.331	5 41 58.08	150.07	23 54 19.5	123.0	71.01	15 34.8	57 4.9	II. N.S.
30	L	1 35.40	2.274	6 11 39.09	146.64	23 19 13.3	226.5	70.18	15 28.9	56 43.4	
30	U	14 2.29	2.206	6 40 34.94	142.59	+22 24 18.5	-320.9	69.20	15 23.1	56 22.0	II. N.S.
Dec. 1	L	2 28.33	2.133	7 8 39.71	138.17	21 11 33.6	404.8	68.11	15 17.4	56 1.2	
1	U	14 53.47	2.057	7 35 50.49	133.63	19 43 6.7	477.9	66.98	15 12.0	55 41.3	II. S.
2	L	3 17.71	1.984	8 2 7.30	129.20	18 1 6.7	540.4	65.87	15 7.0	55 22.7	
2	U	15 41.09	1.915	8 27 32.43	125.05	+16 7 37.3	-592.8	64.80	15 2.4	55 5.8	II. S.
3	L	4 3.69	1.852	8 52 10.04	121.30	14 4 34.7	636.1	63.82	14 58.3	54 50.9	
3	U	16 25.58	1.798	9 16 5.65	118.06	11 53 43.9	671.1	62.96	14 54.8	54 38.2	II. S.
4	L	4 46.89	1.784	9 39 25.74	115.38	9 36 40.0	698.4	62.25	14 52.0	54 27.9	
4	U	17 7.72	1.720	10 2 17.34	113.32	+ 7 14 47.8	-719.1	61.69	14 49.9	54 20.2	II. S.
5	L	5 28.20	1.696	10 24 47.86	111.87	4 49 24.3	733.7	61.30	14 48.6	54 15.3	
5	U	17 48.46	1.683	10 47 4.97	111.08	+ 2 21 40.1	742.7	61.08	14 48.0	54 13.1	II. S.
6	L	6 8.62	1.680	11 9 16.49	110.95	- 0 7 18.2	746.1	61.04	14 48.2	54 13.8	
6	U	18 28.83	1.689	11 31 30.22	111.45	- 2 36 25.6	-744.1	61.17	14 49.1	54 17.2	II. S.
7	L	6 49.20	1.708	11 53 54.02	112.62	5 4 35.7	736.6	61.49	14 50.8	54 23.5	
7	U	19 9.86	1.738	12 16 35.72	114.44	7 30 39.2	723.0	61.97	14 53.2	54 32.4	II. S.
8	L	7 30.96	1.779	12 39 43.04	116.89	9 53 20.7	702.7	62.62	14 56.3	54 43.8	
8	U	19 52.60	1.830	13 3 23.41	119.94	-12 11 16.3	-675.2	63.44	15 0.1	54 57.5	II. S.

Nov. 27, U Defective Illumination of S. 0°.04.
Nov. 28, U Defective Illumination of S. 0°.56.

Nov. 29, U Defective Illumination of S. 0°.05.
Nov. 30, U Defective Illumination of N. 1°.00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi-d. Pass- ing Meri- dian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Dec. 8	U	19 52.60	1.830	13 3 23.41	119.94	-12 11 16.3	-675.2	63.44	15 0.1	54 57.5	II. S.
9	L	8 14.91	1.890	13 27 43.89	123.56	14 22 52.8	639.4	64.38	15 4.4	55 13.4	
9	U	20 37.99	1.958	13 52 50.81	127.67	16 26 24.9	594.3	65.44	15 9.2	55 31.1	II. S.
10	L	9 1.93	2.033	14 18 49.38	132.15	18 19 55.9	539.0	66.58	15 14.5	55 50.3	
10	U	21 26.79	2.111	14 45 43.24	136.85	-20 1 18.1	-472.8	67.76	15 20.0	56 10.7	II. S.
11	L	9 52.59	2.189	15 13 33.83	141.57	21 28 16.1	395.0	68.93	15 25.8	56 31.9	
11	U	22 19.31	2.264	15 42 19.89	146.05	22 38 30.9	305.6	70.02	15 31.6	56 53.3	II. S.
12	L	10 46.88	2.330	16 11 57.02	150.02	23 29 48.7	205.6	70.99	15 37.5	57 14.7	
12	U	23 15.17	2.383	16 42 17.49	153.23	-24 0 8.8	-96.4	71.75	15 43.1	57 35.5	
13	L	11 44.01	2.419	17 13 10.55	155.43	24 7 55.4	+19.5	72.28	15 48.5	57 55.3	
14	U	0 13.17	2.437	17 44 23.14	156.47	23 52 6.0	139.0	72.53	15 53.5	58 13.7	
14	L	12 42.42	2.435	18 15 41.18	156.34	23 12 19.7	258.4	72.51	15 58.1	58 30.3	
15	U	1 11.53	2.414	18 46 50.89	155.11	-22 9 0.0	+374.0	72.23	16 2.1	58 44.9	I. S.
15	L	13 40.30	2.379	19 17 40.25	152.99	20 43 13.2	482.4	71.74	16 5.5	58 57.4	
16	U	2 8.58	2.333	19 48 0.04	150.23	18 56 42.8	580.8	71.09	16 8.2	59 7.5	I. S.
16	L	14 36.27	2.282	20 17 44.34	147.12	16 51 41.8	667.2	70.35	16 10.3	59 15.2	
17	U	3 3.33	2.229	20 46 50.66	143.93	-14 30 42.3	+740.4	69.59	16 11.8	59 20.6	I. S.
17	L	15 29.77	2.179	21 15 19.70	140.94	11 56 27.9	799.6	68.88	16 12.7	59 23.8	
18	U	3 55.65	2.135	21 43 14.76	138.31	9 11 46.5	844.9	68.24	16 13.0	59 24.9	I. S.
18	L	16 21.05	2.100	22 10 41.18	136.20	6 19 25.0	876.4	67.72	16 12.8	59 24.2	
19	U	4 46.08	2.075	22 37 45.73	134.68	-3 22 6.2	+894.5	67.35	16 12.1	59 21.8	I. S.
19	L	17 10.88	2.061	23 4 36.12	133.83	-0 22 28.2	899.7	67.14	16 11.0	59 17.9	
20	U	5 35.58	2.058	23 31 20.50	133.68	+2 36 55.4	892.3	67.11	16 9.6	59 12.7	I. S.
20	L	18 0.32	2.067	23 58 7.11	134.21	5 33 35.7	872.5	67.25	16 7.9	59 6.4	
21	U	6 25.23	2.086	0 25 3.90	135.37	+8 25 6.3	+840.6	67.54	16 5.9	58 59.1	I. S.
21	L	18 50.42	2.115	0 52 18.10	137.09	11 9 2.8	796.8	67.98	16 3.7	58 50.8	
22	U	7 16.01	2.151	1 19 55.88	139.27	13 43 2.3	741.1	68.51	16 1.2	58 41.7	I. S.
22	L	19 42.07	2.192	1 48 1.82	141.76	16 4 43.8	673.8	69.12	15 58.5	58 31.7	
23	U	8 8.64	2.236	2 16 38.56	144.37	+18 11 50.5	+595.4	69.74	15 55.5	58 20.8	I. S.
23	L	20 35.72	2.278	2 45 46.27	146.88	20 2 12.8	606.6	70.33	15 52.3	58 9.2	
24	U	9 3.27	2.314	3 15 22.30	149.05	21 33 53.8	408.8	70.84	15 48.9	57 56.7	I. S.
24	L	21 31.21	2.340	3 45 21.16	150.64	22 45 15.1	303.7	71.20	15 45.3	57 43.3	
25	U	9 59.38	2.353	4 15 34.59	151.45	+23 35 3.2	+193.7	71.36	15 41.4	57 29.2	I. S.
25	L	22 27.63	2.351	4 45 52.20	151.32	24 2 36.1	+81.6	71.30	15 37.3	57 14.3	
26	U	10 55.75	2.333	5 16 2.36	150.20	24 7 45.6	-29.6	71.01	15 33.1	56 58.7	I. N.S.
26	L	23 23.55	2.298	5 45 53.28	148.13	23 50 59.4	137.2	70.48	15 28.7	56 42.7	
27	U	11 50.85	2.250	6 15 14.19	145.23	+23 13 17.2	-238.5	69.75	15 24.2	56 26.2	I. II. N.S.
28	L	0 17.51	2.191	6 43 56.17	141.68	22 16 6.9	331.6	68.86	15 19.7	56 9.6	
28	U	12 43.41	2.125	7 11 52.80	137.71	21 1 16.0	415.2	67.86	15 15.2	55 53.1	II. N.S.
29	L	1 8.50	2.056	7 39 0.45	133.55	19 30 44.5	488.3	66.81	15 10.8	55 37.0	
29	U	13 32.75	1.987	8 5 18.00	129.39	+17 46 37.1	-551.1	65.75	15 6.6	55 21.4	II. S.
30	L	1 56.19	1.921	8 30 46.71	125.43	15 50 57.8	603.7	64.73	15 2.6	55 6.7	
30	U	14 18.88	1.861	8 55 29.70	121.80	13 45 45.4	646.8	63.79	14 58.9	54 53.1	II. S.
31	L	2 40.88	1.807	9 19 31.53	118.59	11 32 50.2	681.1	62.95	14 55.6	54 41.0	
31	U	15 2.29	1.762	9 42 57.83	115.89	+9 13 53.6	-707.1	62.23	14 52.7	54 30.5	II. S.

Dec. 26, U Defective Illumination of N. 0°.00.
Dec. 27, U Defective Illumination of II. 0°.05.

Dec. 27, U Defective Illumination of N. 0°.00.
Dec. 28, U Defective Illumination of N. 0°.03.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	" "	" "	s		h m	h m s	° ' "	" "	" "	s
Jan. 1	1 27	20 10 12.08	-21 24 9.6	8.6	3.3	0.23	Feb. 15	22 32	20 16 9.92	-20 1 11.5	8.4	3.2	0.23
2	1 27	20 14 40.02	20 59 40.9	8.8	3.3	0.24	16	22 33	20 21 13.91	19 53 42.2	8.3	3.1	0.22
3	1 27	20 18 43.30	20 34 58.3	9.0	3.4	0.24	17	22 34	20 26 24.72	19 44 57.2	8.2	3.1	0.22
4	1 27	20 22 18.89	20 10 17.8	9.3	3.5	0.25	18	22 36	20 31 41.78	19 34 56.4	8.1	3.1	0.22
5	1 26	20 25 23.54	19 45 57.0	9.6	3.6	0.25	19	22 37	20 37 4.55	19 23 39.1	8.0	3.0	0.21
6	1 25	20 27 53.87	-19 22 15.4	9.9	3.7	0.26	20	22 39	20 42 32.57	-19 11 4.9	7.9	3.0	0.21
7	1 23	20 29 46.56	18 59 33.2	10.2	3.9	0.27	21	22 40	20 48 5.40	18 57 14.0	7.8	3.0	0.21
8	1 20	20 30 58.39	18 38 11.9	10.5	4.0	0.28	22	22 42	20 53 42.69	18 42 5.8	7.7	2.9	0.21
9	1 17	20 31 26.53	18 18 32.5	10.8	4.1	0.28	23	22 44	20 59 24.07	18 25 40.1	7.6	2.9	0.20
10	1 12	20 31 8.71	18 0 55.6	11.1	4.2	0.29	24	22 45	21 5 9.25	18 7 57.2	7.5	2.9	0.20
11	1 7	20 30 3.48	-17 45 39.5	11.5	4.4	0.30	25	22 47	21 10 57.94	-17 48 56.7	7.5	2.8	0.20
12	1 2	20 28 10.56	17 32 59.3	11.8	4.5	0.31	26	22 49	21 16 49.92	17 28 38.4	7.4	2.8	0.20
13	0 55	20 25 31.09	17 23 5.9	12.1	4.6	0.32	27	22 51	21 22 44.96	17 7 2.8	7.3	2.8	0.19
14	0 48	20 22 7.80	17 16 5.3	12.4	4.7	0.33	28	22 53	21 28 42.91	16 44 9.5	7.2	2.8	0.19
15	0 40	20 18 5.23	17 11 57.8	12.6	4.8	0.34	Mar. 1	22 55	21 34 43.57	16 19 58.9	7.2	2.7	0.19
16	0 31	20 13 29.58	-17 10 37.0	12.9	4.9	0.34	2	22 57	21 40 46.85	-15 54 30.7	7.1	2.7	0.19
17	0 22	20 8 28.60	17 11 52.5	13.0	5.0	0.34	3	22 59	21 46 52.60	15 27 45.2	7.1	2.7	0.19
18	0 13	20 3 11.18	17 15 28.6	13.2	5.0	0.35	4	23 2	21 53 0.73	14 59 42.4	7.0	2.7	0.18
19	0 4	19 57 46.81	17 21 7.3	13.2	5.0	0.35	5	23 4	21 59 11.20	14 30 22.7	7.0	2.6	0.18
19	23 55	19 52 25.03	17 28 28.8	13.3	5.0	0.35	6	23 6	22 5 23.93	13 59 46.1	6.9	2.6	0.18
20	23 45	19 47 14.80	-17 37 13.2	13.2	5.0	0.35	7	23 8	22 11 38.89	-13 27 52.7	6.9	2.6	0.18
21	23 37	19 42 24.04	17 47 1.8	13.1	5.0	0.35	8	23 11	22 17 56.07	12 54 42.9	6.8	2.6	0.18
22	23 28	19 37 59.32	17 57 37.3	13.0	4.9	0.35	9	23 13	22 24 15.45	12 20 16.9	6.8	2.6	0.18
23	23 21	19 34 5.63	18 8 44.7	12.9	4.9	0.34	10	23 16	22 30 37.10	11 44 35.0	6.8	2.6	0.17
24	23 13	19 30 46.46	18 20 10.2	12.7	4.8	0.34	11	23 18	22 37 0.99	11 7 37.5	6.7	2.5	0.17
25	23 7	19 28 3.83	-18 31 42.6	12.5	4.7	0.33	12	23 21	22 43 27.18	-10 29 24.8	6.7	2.5	0.17
26	23 1	19 25 58.57	18 43 11.9	12.2	4.6	0.33	13	23 23	22 49 55.74	9 49 57.4	6.7	2.5	0.17
27	22 55	19 24 30.47	18 54 29.3	12.0	4.6	0.32	14	23 26	22 56 26.75	9 9 15.7	6.6	2.5	0.17
28	22 50	19 23 38.58	19 5 27.1	11.7	4.5	0.32	15	23 28	23 3 0.27	8 27 20.6	6.6	2.5	0.17
29	22 46	19 23 21.42	19 15 58.8	11.5	4.4	0.31	16	23 31	23 9 36.39	7 44 12.5	6.6	2.5	0.17
30	22 43	19 23 37.10	-19 25 58.2	11.3	4.3	0.30	17	23 34	23 16 15.22	-6 59 52.8	6.6	2.5	0.17
31	22 39	19 24 23.57	19 35 19.9	11.0	4.2	0.30	18	23 36	23 22 56.87	6 14 22.0	6.5	2.5	0.17
Feb. 1	22 37	19 25 38.68	19 43 59.1	10.8	4.1	0.29	19	23 39	23 29 41.42	5 27 41.5	6.5	2.5	0.17
2	22 34	19 27 20.29	19 51 51.3	10.6	4.0	0.29	20	23 42	23 36 28.99	4 39 52.9	6.5	2.5	0.17
3	22 33	19 29 26.28	19 58 52.8	10.3	3.9	0.28	21	23 45	23 43 19.68	3 50 57.8	6.5	2.5	0.16
4	22 31	19 31 54.63	-20 5 0.1	10.1	3.8	0.27	22	23 48	23 50 13.62	-3 0 58.3	6.5	2.5	0.16
5	22 30	19 34 43.41	20 10 9.9	9.9	3.8	0.27	23	23 51	23 57 10.85	2 9 56.8	6.5	2.5	0.16
6	22 29	19 37 50.90	20 14 19.5	9.8	3.7	0.26	24	23 54	0 4 11.46	1 17 56.2	6.5	2.5	0.16
7	22 29	19 41 15.43	20 17 26.4	9.6	3.6	0.26	25	23 57	0 11 15.53	-0 25 0.0	6.5	2.5	0.16
8	22 28	19 44 55.51	20 19 28.6	9.4	3.6	0.25	27	0 0	0 18 23.02	+ 0 28 48.3	6.5	2.5	0.16
9	22 28	19 48 49.78	-20 20 23.9	9.2	3.5	0.25	28	0 3	0 25 33.95	+ 1 23 23.6	6.5	2.5	0.16
10	22 28	19 52 56.95	20 20 10.8	9.1	3.4	0.25	29	0 7	0 32 48.23	2 18 40.7	6.6	2.5	0.17
11	22 29	19 57 15.87	20 18 47.5	8.9	3.4	0.24	30	0 10	0 40 5.73	3 14 33.4	6.6	2.5	0.17
12	22 29	20 1 45.54	20 16 13.2	8.8	3.3	0.24	31	0 13	0 47 26.25	4 10 54.8	6.6	2.5	0.17
13	22 30	20 6 24.99	20 12 26.2	8.7	3.3	0.23	Apr. 1	0 17	0 54 49.50	5 7 36.7	6.7	2.5	0.17
14	22 31	20 11 13.38	-20 7 26.0	8.5	3.2	0.23	2	0 20	1 2 15.08	+ 6 4 30.1	6.7	2.5	0.17
15	22 32	20 16 9.92	-20 1 11.5	8.4	3.2	0.23	3	0 24	1 9 42.50	+ 7 1 24.8	6.8	2.6	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidian.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidian.	S. T. of Sem. Pass. Mer.
	h m s	h m s	" ' "	"	"	s		h m s	h m s	" ' "	"	"	s
Apr. 1	0 17	0 54 49.50	+ 5 7 36.7	6.7	2.5	0.17	May 16	23 52	3 31 2.07	+17 57 11.5	16.0	6.0	0.42
2	0 20	1 2 15.08	6 4 30.1	6.7	2.5	0.17	17	23 46	3 28 58.23	17 32 12.5	16.0	6.0	0.42
3	0 24	1 9 42.50	7 1 24.8	6.8	2.6	0.17	18	23 40	3 26 58.20	17 7 46.9	15.9	6.0	0.42
4	0 27	1 17 11.18	7 58 10.2	6.8	2.6	0.17	19	23 34	3 25 4.07	16 44 11.5	15.9	6.0	0.42
5	0 31	1 24 40.36	8 54 34.0	6.9	2.6	0.18	20	23 28	3 23 17.75	16 21 42.8	15.8	6.0	0.42
6	0 34	1 32 9.24	+ 9 50 23.9	7.0	2.6	0.18	21	23 23	3 21 40.98	+16 0 35.1	15.7	5.9	0.41
7	0 38	1 39 36.85	10 45 26.8	7.1	2.7	0.18	22	23 17	3 20 15.26	15 41 1.9	15.5	5.9	0.41
8	0 41	1 47 2.14	11 39 29.4	7.2	2.7	0.18	23	23 12	3 19 1.95	15 23 14.6	15.4	5.8	0.40
9	0 45	1 54 23.97	12 32 18.0	7.3	2.8	0.19	24	23 7	3 18 2.14	15 7 22.7	15.2	5.7	0.40
10	0 48	2 1 41.11	13 23 39.8	7.4	2.8	0.19	25	23 3	3 17 16.78	14 53 33.8	14.9	5.7	0.39
11	0 51	2 8 52.31	+14 13 22.1	7.5	2.9	0.19	26	22 58	3 16 46.59	+14 41 53.4	14.7	5.6	0.39
12	0 54	2 15 56.28	15 1 13.4	7.7	2.9	0.20	27	22 54	3 16 32.12	14 32 25.5	14.5	5.5	0.38
13	0 57	2 22 51.73	15 47 3.1	7.7	3.0	0.20	28	22 50	3 16 33.75	14 25 12.5	14.2	5.4	0.37
14	1 0	2 29 37.41	16 30 42.1	8.0	3.0	0.21	29	22 47	3 16 51.76	14 20 14.8	14.0	5.3	0.37
15	1 3	2 36 12.09	17 12 2.2	8.1	3.1	0.21	30	22 43	3 17 26.31	14 17 31.9	13.7	5.2	0.36
16	1 5	2 42 34.60	+17 50 57.1	8.3	3.2	0.22	31	22 40	3 18 17.43	+14 17 1.8	13.4	5.1	0.35
17	1 7	2 48 43.85	18 27 21.8	8.5	3.2	0.23	June 1	22 37	3 19 25.11	14 18 42.0	13.2	5.0	0.34
18	1 9	2 54 38.79	19 1 12.5	8.7	3.3	0.23	2	22 35	3 20 49.27	14 22 28.7	12.9	4.9	0.34
19	1 11	3 0 18.48	19 32 26.2	9.0	3.4	0.24	3	22 32	3 22 29.77	14 28 17.4	12.6	4.8	0.33
20	1 13	3 5 41.98	20 1 1.7	9.2	3.5	0.25	4	22 30	3 24 26.45	14 36 3.3	12.3	4.7	0.32
21	1 14	3 10 48.49	+20 26 58.1	9.5	3.6	0.25	5	22 29	3 26 39.13	+14 45 40.9	12.1	4.6	0.32
22	1 15	3 15 37.23	20 50 15.4	9.7	3.7	0.26	6	22 27	3 29 7.68	14 57 4.7	11.8	4.5	0.31
23	1 15	3 20 7.48	21 10 53.8	10.0	3.8	0.27	7	22 26	3 31 51.89	15 10 8.9	11.5	4.4	0.30
24	1 15	3 24 18.61	21 28 54.2	10.2	3.9	0.28	8	22 25	3 34 51.60	15 24 46.7	11.3	4.3	0.30
25	1 15	3 28 10.00	21 44 17.8	10.5	4.0	0.28	9	22 24	3 38 6.65	15 40 52.1	11.0	4.2	0.29
26	1 15	3 31 41.12	+21 57 6.0	10.8	4.1	0.29	10	22 24	3 41 36.94	+15 58 18.5	10.8	4.1	0.28
27	1 14	3 34 51.53	22 7 20.2	11.1	4.2	0.30	11	22 24	3 45 22.33	16 16 59.0	10.5	4.0	0.28
28	1 13	3 37 40.76	22 15 1.9	11.4	4.3	0.31	12	22 24	3 49 22.76	16 36 46.9	10.3	3.9	0.27
29	1 12	3 40 8.53	22 20 12.5	11.7	4.5	0.32	13	22 24	3 53 38.18	16 57 35.2	10.1	3.8	0.27
30	1 10	3 42 14.58	22 22 54.2	12.1	4.6	0.33	14	22 25	3 58 8.56	17 19 16.9	9.9	3.7	0.26
May 1	1 8	3 43 58.77	+22 23 8.3	12.4	4.7	0.34	15	22 26	4 2 53.94	+17 41 44.8	9.6	3.7	0.26
2	1 5	3 45 21.10	22 20 56.8	12.7	4.8	0.35	16	22 27	4 7 54.30	18 4 51.3	9.4	3.6	0.25
3	1 2	3 46 21.69	22 16 22.3	13.0	4.9	0.35	17	22 28	4 13 9.74	18 28 28.7	9.2	3.5	0.25
4	0 59	3 47 0.81	22 9 27.5	13.3	5.1	0.36	18	22 30	4 18 40.31	18 52 28.9	9.0	3.4	0.24
5	0 55	3 47 18.91	22 0 15.7	13.6	5.2	0.37	19	22 31	4 24 26.11	19 16 43.8	8.8	3.4	0.24
6	0 51	3 47 16.68	+21 48 50.8	14.0	5.3	0.38	20	22 33	4 30 27.24	+19 41 4.6	8.7	3.3	0.23
7	0 47	3 46 54.94	21 35 18.1	14.2	5.4	0.39	21	22 36	4 36 43.75	20 5 22.2	8.5	3.2	0.23
8	0 42	3 46 14.77	21 19 43.8	14.5	5.5	0.39	22	22 38	4 43 15.73	20 29 27.1	8.3	3.2	0.23
9	0 37	3 45 17.48	21 2 15.3	14.8	5.6	0.40	23	22 41	4 50 3.21	20 53 9.2	8.1	3.1	0.22
10	0 32	3 44 4.56	20 43 1.8	15.0	5.7	0.40	24	22 44	4 57 6.19	21 16 18.1	8.0	3.0	0.22
11	0 27	3 42 37.76	+20 22 13.4	15.2	5.8	0.41	25	22 48	5 4 24.56	+21 38 42.6	7.9	3.0	0.22
12	0 21	3 40 58.99	20 0 2.7	15.4	5.9	0.42	26	22 51	5 11 58.15	22 0 11.2	7.7	2.9	0.21
13	0 16	3 39 10.33	19 36 42.5	15.6	5.9	0.42	27	22 55	5 19 46.70	22 20 32.3	7.6	2.9	0.21
14	0 10	3 37 13.98	19 12 29.0	15.7	6.0	0.42	28	22 59	5 27 49.76	22 39 33.6	7.5	2.8	0.21
15	0 4	3 35 12.25	18 47 37.6	15.8	6.0	0.42	29	23 3	5 36 6.79	22 57 2.7	7.3	2.8	0.20
15	23 58	3 33 7.50	+18 22 25.8	15.9	6.0	0.42	30	23 8	5 44 37.05	+23 12 47.6	7.2	2.8	0.20
16	23 52	3 31 2.07	+17 57 11.5	16.0	6.0	0.42	July 1	23 13	5 53 19.64	+23 26 36.5	7.1	2.7	0.20

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	23 13	5 53 19.64	+23 26 36.5	7.1	2.7	0.20	Aug. 17	1 43	11 25 1.23	+2 26 47.9	8.8	3.3	0.22
2	23 18	6 2 13.42	23 38 17.9	7.1	2.7	0.20	18	1 43	11 28 59.79	1 50 26.7	8.9	3.4	0.23
3	23 23	6 11 17.14	23 47 41.1	7.0	2.6	0.19	19	1 43	11 32 49.85	1 14 51.6	9.1	3.4	0.23
4	23 28	6 20 29.34	23 54 37.1	6.9	2.6	0.19	20	1 42	11 36 31.09	0 40 7.1	9.2	3.5	0.23
5	23 33	6 29 48.45	23 58 58.0	6.8	2.6	0.19	21	1 42	11 40 3.21	+0 6 17.5	9.3	3.5	0.24
6	23 39	6 39 12.74	+24 0 37.5	6.8	2.6	0.19	22	1 41	11 43 25.85	-0 26 32.5	9.5	3.6	0.24
7	23 44	6 48 40.46	23 59 31.2	6.7	2.5	0.19	23	1 41	11 46 38.58	0 58 17.8	9.6	3.7	0.24
8	23 50	6 58 9.80	23 55 37.0	6.7	2.5	0.18	24	1 40	11 49 40.91	1 28 52.7	9.8	3.7	0.25
9	23 55	7 7 39.01	23 48 54.6	6.7	2.5	0.18	25	1 39	11 52 32.35	1 58 11.4	10.0	3.8	0.25
11	0 1	7 17 6.37	23 39 25.5	6.6	2.5	0.18	26	1 37	11 55 12.29	2 26 7.5	10.1	3.8	0.26
12	0 6	7 26 30.28	+23 27 13.2	6.6	2.5	0.18	27	1 36	11 57 40.07	-2 52 34.0	10.3	3.9	0.26
13	0 12	7 35 49.31	23 12 22.5	6.6	2.5	0.18	28	1 34	11 59 54.99	3 17 23.5	10.5	4.0	0.27
14	0 17	7 45 2.16	22 54 59.8	6.6	2.5	0.18	29	1 32	12 1 56.30	3 40 27.8	10.7	4.0	0.27
15	0 22	7 54 7.70	22 35 12.3	6.6	2.5	0.18	30	1 30	12 3 43.19	4 1 38.1	10.9	4.1	0.27
16	0 27	8 3 4.98	22 13 8.0	6.6	2.5	0.18	31	1 28	12 5 14.79	4 20 45.1	11.1	4.2	0.28
17	0 32	8 11 53.24	+21 48 55.8	6.6	2.5	0.18	Sept. 1	1 25	12 6 30.22	-4 37 38.7	11.3	4.3	0.28
18	0 37	8 20 31.87	21 22 44.2	6.6	2.5	0.18	2	1 22	12 7 28.54	4 52 8.2	11.5	4.4	0.29
19	0 41	8 29 0.41	20 54 42.4	6.6	2.5	0.18	3	1 19	12 8 8.80	5 4 2.1	11.7	4.4	0.30
20	0 45	8 37 18.55	20 24 59.2	6.7	2.5	0.18	4	1 15	12 8 30.11	5 13 8.5	11.9	4.5	0.30
21	0 50	8 45 26.09	19 53 43.4	6.7	2.5	0.18	5	1 11	12 8 31.59	5 19 15.0	12.1	4.6	0.31
22	0 54	8 53 22.91	+19 21 3.4	6.7	2.6	0.18	6	1 7	12 8 12.48	-5 22 9.2	12.3	4.7	0.31
23	0 57	9 1 8.99	18 47 7.5	6.8	2.6	0.18	7	1 3	12 7 32.12	5 21 39.2	12.6	4.8	0.32
24	1 1	9 8 44.41	18 12 3.4	6.8	2.6	0.18	8	0 58	12 6 30.05	5 17 33.0	12.8	4.8	0.32
25	1 5	9 16 9.24	17 35 58.4	6.9	2.6	0.18	9	0 52	12 5 6.13	5 9 40.8	12.9	4.9	0.33
26	1 8	9 23 23.64	16 58 59.6	6.9	2.6	0.18	10	0 47	12 3 20.51	4 57 54.4	13.1	5.0	0.33
27	1 11	9 30 27.82	+16 21 13.4	7.0	2.6	0.18	11	0 41	12 1 13.76	-4 42 8.6	13.3	5.0	0.34
28	1 14	9 37 21.93	15 42 45.8	7.0	2.7	0.18	12	0 34	11 58 47.00	4 22 22.2	13.4	5.1	0.34
29	1 17	9 44 6.22	15 3 43.0	7.1	2.7	0.19	13	0 27	11 56 1.89	3 58 39.0	13.6	5.1	0.34
30	1 19	9 50 40.92	14 24 10.1	7.1	2.7	0.19	14	0 21	11 53 0.76	3 31 9.2	13.6	5.2	0.35
31	1 22	9 57 6.22	13 44 12.4	7.2	2.7	0.19	15	0 13	11 49 46.56	3 0 9.1	13.7	5.2	0.35
Aug. 1	1 24	10 3 22.37	+13 3 54.6	7.3	2.8	0.19	16	0 6	11 46 22.91	-2 26 3.2	13.7	5.2	0.35
2	1 26	10 9 29.55	12 23 21.2	7.3	2.8	0.19	16	23 59	11 42 54.05	1 49 22.8	13.7	5.2	0.35
3	1 28	10 15 28.01	11 42 36.7	7.4	2.8	0.19	17	23 51	11 39 24.69	1 10 46.5	13.6	5.2	0.34
4	1 30	10 21 17.94	11 1 44.9	7.5	2.8	0.19	18	23 44	11 35 59.89	-0 30 59.0	13.5	5.1	0.34
5	1 32	10 26 59.49	10 20 49.8	7.6	2.9	0.19	19	23 37	11 32 44.95	+0 9 10.8	13.3	5.1	0.34
6	1 34	10 32 32.85	+ 9 39 55.2	7.7	2.9	0.20	20	23 30	11 29 45.03	+0 48 51.9	13.1	5.0	0.33
7	1 35	10 37 58.14	8 59 4.5	7.8	2.9	0.20	21	23 23	11 27 5.11	1 27 12.6	12.9	4.9	0.33
8	1 36	10 43 15.49	8 18 21.3	7.8	3.0	0.20	22	23 17	11 24 49.71	2 3 24.4	12.6	4.8	0.32
9	1 38	10 48 25.01	7 37 49.0	7.9	3.0	0.20	23	23 11	11 23 2.73	2 36 41.9	12.3	4.7	0.31
10	1 39	10 53 26.75	6 57 31.2	8.0	3.0	0.20	24	23 6	11 21 47.31	3 6 26.3	12.0	4.6	0.31
11	1 40	10 58 20.76	+ 6 17 30.9	8.1	3.1	0.21	25	23 2	11 21 5.83	+3 32 4.8	11.7	4.4	0.30
12	1 40	11 3 7.05	5 37 51.6	8.2	3.1	0.21	26	22 58	11 20 59.76	3 53 12.4	11.3	4.3	0.29
13	1 41	11 7 45.62	4 58 36.6	8.3	3.2	0.21	27	22 54	11 21 29.76	4 9 31.1	11.0	4.2	0.28
14	1 42	11 12 16.41	4 19 49.1	8.5	3.2	0.21	28	22 51	11 22 35.73	4 20 50.5	10.7	4.1	0.27
15	1 42	11 16 39.36	3 41 32.8	8.6	3.2	0.22	29	22 49	11 24 16.85	4 27 6.2	10.3	3.9	0.26
16	1 43	11 20 54.35	+ 3 3 51.3	8.7	3.3	0.22	30	22 47	11 26 31.71	+4 28 20.4	10.0	3.8	0.26
17	1 43	11 25 1.23	+ 2 26 47.9	8.8	3.3	0.22	Oct. 1	1 22	46 11 29 18.41	+4 24 40.0	9.7	3.7	0.25

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	22 46	11 29 18.41	+ 4 24 40.0	9.7	3.7	0.25	Nov. 15	0 12	15 49 11.38	-21 7 35.1	6.1	2.3	0.17
2	22 45	11 32 34.70	4 16 16.2	9.4	3.6	0.24	16	0 15	15 55 37.87	21 33 2.3	6.2	2.3	0.17
3	22 45	11 36 18.06	4 3 23.8	9.1	3.5	0.23	17	0 17	16 2 5.64	21 57 25.8	6.2	2.3	0.17
4	22 45	11 40 25.83	3 46 20.3	8.9	3.4	0.23	18	0 20	16 8 34.68	22 20 44.0	6.2	2.4	0.17
5	22 46	11 44 55.28	3 25 25.0	8.6	3.3	0.22	19	0 22	16 15 4.95	22 42 55.4	6.2	2.4	0.17
6	22 47	11 49 43.78	+ 3 0 58.2	8.4	3.2	0.21	20	0 25	16 21 36.45	-23 3 58.6	6.3	2.4	0.17
7	22 48	11 54 48.72	2 33 21.1	8.2	3.1	0.21	21	0 28	16 28 9.10	23 23 52.3	6.3	2.4	0.17
8	22 49	12 0 7.73	2 2 54.6	8.0	3.0	0.20	22	0 30	16 34 42.84	23 42 34.8	6.3	2.4	0.17
9	22 51	12 5 38.58	1 29 59.1	7.8	3.0	0.20	23	0 33	16 41 17.58	24 0 4.8	6.4	2.4	0.18
10	22 53	12 11 19.28	0 54 54.3	7.7	2.9	0.19	24	0 35	16 47 53.20	24 16 21.1	6.4	2.4	0.18
11	22 55	12 17 8.06	+ 0 17 58.8	7.5	2.8	0.19	25	0 38	16 54 29.59	-24 31 22.2	6.4	2.4	0.18
12	22 57	12 23 3.33	- 0 20 30.0	7.4	2.8	0.19	26	0 41	17 1 6.54	24 45 6.3	6.5	2.5	0.18
13	22 59	12 29 3.82	1 0 16.4	7.2	2.8	0.18	27	0 43	17 7 43.89	24 57 32.3	6.5	2.5	0.18
14	23 1	12 35 8.35	1 41 5.9	7.1	2.7	0.18	28	0 46	17 14 21.39	25 8 38.8	6.6	2.5	0.18
15	23 3	12 41 15.99	2 22 45.1	7.0	2.7	0.18	29	0 49	17 20 58.79	25 18 24.4	6.7	2.5	0.19
16	23 5	12 47 25.95	- 3 5 2.4	6.9	2.6	0.18	30	0 51	17 27 35.78	-25 26 48.1	6.7	2.5	0.19
17	23 7	12 53 37.58	3 47 47.3	6.8	2.6	0.17	Dec. 1	0 54	17 34 12.01	25 33 48.3	6.8	2.6	0.19
18	23 10	12 59 50.37	4 30 50.2	6.7	2.6	0.17	2	0 57	17 40 47.07	25 39 23.9	6.9	2.6	0.19
19	23 12	13 6 3.92	5 14 3.0	6.7	2.5	0.17	3	0 59	17 47 20.51	25 43 34.1	6.9	2.6	0.19
20	23 14	13 12 17.90	5 57 18.1	6.6	2.5	0.17	4	1 2	17 53 51.79	25 46 17.9	7.0	2.7	0.20
21	23 16	13 18 32.10	- 6 40 29.2	6.5	2.5	0.17	5	1 4	18 0 20.34	-25 47 34.7	7.1	2.7	0.20
22	23 19	13 24 46.34	7 23 30.2	6.5	2.5	0.17	6	1 7	18 6 45.43	25 47 23.9	7.2	2.7	0.20
23	23 21	13 31 0.51	8 6 16.6	6.4	2.4	0.16	7	1 9	18 13 6.33	25 45 45.3	7.3	2.8	0.20
24	23 23	13 37 14.56	8 48 43.5	6.4	2.4	0.16	8	1 12	18 19 22.14	25 42 39.2	7.4	2.8	0.21
25	23 26	13 43 28.47	9 30 46.9	6.3	2.4	0.16	9	1 14	18 25 31.89	25 38 5.6	7.5	2.9	0.21
26	23 28	13 49 42.19	-10 12 23.3	6.3	2.4	0.16	10	1 16	18 31 34.43	-25 32 5.7	7.7	2.9	0.22
27	23 30	13 55 55.82	10 53 29.6	6.3	2.4	0.16	11	1 18	18 37 28.47	25 24 40.9	7.8	3.0	0.22
28	23 32	14 2 9.39	11 34 2.8	6.2	2.4	0.16	12	1 20	18 43 12.60	25 15 53.2	8.0	3.0	0.23
29	23 35	14 8 22.94	12 14 0.5	6.2	2.3	0.16	13	1 21	18 48 45.16	25 5 45.1	8.1	3.1	0.23
30	23 37	14 14 36.57	12 53 20.3	6.2	2.3	0.16	14	1 23	18 54 4.32	24 54 20.0	8.3	3.1	0.23
31	23 39	14 20 50.35	-13 32 0.0	6.2	2.3	0.16	15	1 24	18 59 8.02	-24 41 42.3	8.5	3.2	0.23
Nov. 1	23 41	14 27 4.41	14 9 57.6	6.1	2.3	0.16	16	1 25	19 3 53.96	24 27 57.3	8.7	3.3	0.24
2	23 44	14 33 18.80	14 47 11.4	6.1	2.3	0.16	17	1 25	19 8 19.53	24 13 11.6	8.9	3.4	0.25
3	23 46	14 39 33.64	15 23 39.7	6.1	2.3	0.16	18	1 25	19 12 21.93	23 57 32.7	9.1	3.4	0.25
4	23 48	14 45 49.03	15 59 20.8	6.1	2.3	0.16	19	1 25	19 15 58.06	23 41 9.0	9.3	3.5	0.26
5	23 51	14 52 5.06	-16 34 13.0	6.1	2.3	0.16	20	1 24	19 19 4.59	-23 24 10.7	9.6	3.7	0.27
6	23 53	14 58 21.81	17 8 15.0	6.1	2.3	0.16	21	1 23	19 21 37.99	23 6 49.0	9.9	3.8	0.27
7	23 55	15 4 39.38	17 41 25.4	6.1	2.3	0.16	22	1 21	19 23 34.66	22 49 16.1	10.2	3.9	0.28
8	23 58	15 10 57.85	18 13 42.7	6.1	2.3	0.16	23	1 18	19 24 51.02	22 31 44.3	10.5	4.0	0.29
10	0 0	15 17 17.30	18 45 5.5	6.1	2.3	0.16	24	1 15	19 25 23.68	22 14 27.0	10.8	4.1	0.29
11	0 3	15 23 37.79	-19 15 32.5	6.1	2.3	0.16	25	1 10	19 25 9.71	-21 57 37.6	11.1	4.2	0.30
12	0 5	15 29 59.41	19 45 2.3	6.1	2.3	0.16	26	1 5	19 24 6.85	21 41 28.0	11.4	4.3	0.31
13	0 7	15 36 22.19	20 13 33.5	6.1	2.3	0.16	27	1 0	19 22 14.03	21 26 9.8	11.7	4.5	0.32
14	0 10	15 42 46.17	20 41 5.0	6.1	2.3	0.17	28	0 53	19 19 31.58	21 11 51.8	12.0	4.6	0.32
15	0 12	15 49 11.38	21 7 35.1	6.1	2.3	0.17	29	0 46	19 16 1.60	20 58 41.8	12.3	4.7	0.33
16	0 15	15 55 37.87	-21 33 2.3	6.2	2.3	0.17	30	0 38	19 11 48.24	-20 46 44.7	12.6	4.8	0.34
17	0 17	16 2 5.64	-21 57 25.8	6.2	2.3	0.17	31	0 29	19 6 57.75	-20 36 4.3	12.8	4.8	0.34

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	22 3	16 46 2.78	-21 11 13.0	6.2	6.0	0.43	Feb. 15	23 7	20 51 31.88	-18 26 38.9	5.5	5.3	0.38
1	22 5	16 51 19.66	21 22 39.8	6.2	6.0	0.43	16	23 8	20 56 37.79	18 8 6.9	5.5	5.3	0.37
2	22 6	16 56 37.44	21 33 29.8	6.1	5.9	0.42	17	23 10	21 1 42.55	17 49 3.7	5.4	5.3	0.37
3	22 7	17 1 156.05	21 43 42.2	6.1	5.9	0.42	18	23 11	21 6 46.19	17 29 29.9	5.4	5.3	0.37
4	22 9	17 7 15.47	21 53 16.8	6.1	5.9	0.42	19	23 12	21 11 48.66	17 9 26.4	5.4	5.3	0.37
5	22 10	17 12 35.67	-22 2 12.9	6.1	5.9	0.42	20	23 13	21 16 49.97	-16 48 53.7	5.4	5.3	0.37
6	22 11	17 17 56.59	22 10 30.2	6.0	5.9	0.42	21	23 14	21 21 50.13	16 27 52.6	5.4	5.3	0.37
7	22 13	17 23 18.19	22 18 8.1	6.0	5.9	0.42	22	23 15	21 26 49.12	16 6 23.7	5.4	5.2	0.37
8	22 14	17 28 40.42	22 25 6.4	6.0	5.8	0.42	23	23 16	21 31 46.95	15 44 27.9	5.4	5.2	0.36
9	22 16	17 34 3.25	22 31 24.6	6.0	5.8	0.42	24	23 17	21 36 43.62	15 22 6.0	5.4	5.2	0.36
10	22 17	17 39 26.61	-22 37 2.4	6.0	5.8	0.42	25	23 18	21 41 39.16	-14 59 18.5	5.4	5.2	0.36
11	22 19	17 44 50.45	22 41 59.4	6.0	5.8	0.42	26	23 19	21 46 33.56	14 36 6.2	5.4	5.2	0.36
12	22 20	17 50 14.73	22 46 15.6	5.9	5.8	0.42	27	23 20	21 51 26.83	14 12 29.8	5.3	5.2	0.36
13	22 22	17 55 39.38	22 49 50.5	5.9	5.7	0.42	28	23 21	21 56 18.99	13 48 30.3	5.3	5.2	0.36
14	22 23	18 1 4.35	22 52 43.9	5.9	5.7	0.41	Mar. 1	23 22	22 1 10.07	13 24 8.1	5.3	5.2	0.36
15	22 25	18 6 29.57	-22 54 55.6	5.9	5.7	0.41	2	23 22	22 6 0.08	-12 59 24.1	5.3	5.2	0.35
16	22 26	18 11 55.00	22 56 25.4	5.9	5.7	0.41	3	23 23	22 10 49.05	12 34 19.0	5.3	5.2	0.35
17	22 27	18 17 20.58	22 57 13.3	5.9	5.7	0.41	4	23 24	22 15 36.98	12 8 53.5	5.3	5.2	0.35
18	22 29	18 22 46.21	22 57 19.2	5.8	5.7	0.41	5	23 25	22 20 23.91	11 43 8.3	5.3	5.2	0.35
19	22 30	18 28 11.87	22 56 42.9	5.8	5.7	0.41	6	23 26	22 25 9.88	11 17 4.2	5.3	5.1	0.35
20	22 32	18 33 37.50	-22 55 24.6	5.8	5.6	0.41	7	23 27	22 29 54.88	-10 50 42.0	5.3	5.1	0.35
21	22 33	18 39 3.02	22 53 24.2	5.8	5.6	0.41	8	23 27	22 34 38.98	10 24 2.2	5.3	5.1	0.35
22	22 35	18 44 28.34	22 50 41.8	5.8	5.6	0.41	9	23 28	22 39 22.18	9 57 5.8	5.3	5.1	0.35
23	22 36	18 49 53.45	22 47 17.5	5.8	5.6	0.41	10	23 29	22 44 4.53	9 29 53.3	5.3	5.1	0.35
24	22 38	18 55 18.27	22 43 11.4	5.7	5.6	0.40	11	23 30	22 48 46.06	9 2 25.6	5.3	5.1	0.34
25	22 39	19 0 42.73	-22 38 23.5	5.7	5.6	0.40	12	23 30	22 53 26.79	-8 34 43.5	5.2	5.1	0.34
26	22 41	19 6 6.78	22 32 54.2	5.7	5.6	0.40	13	23 31	22 58 6.76	8 6 47.4	5.2	5.1	0.34
27	22 42	19 11 30.37	22 26 43.7	5.7	5.5	0.40	14	23 32	23 2 46.02	7 38 38.4	5.2	5.1	0.34
28	22 44	19 16 53.44	22 19 52.2	5.7	5.5	0.40	15	23 33	23 7 24.59	7 10 16.9	5.2	5.1	0.34
29	22 45	19 22 15.93	22 12 19.9	5.7	5.5	0.40	16	23 33	23 12 2.50	6 41 44.0	5.2	5.1	0.34
30	22 46	19 27 37.81	-22 4 7.1	5.7	5.5	0.40	17	23 34	23 16 39.79	-6 13 0.1	5.2	5.1	0.34
31	22 48	19 32 59.02	21 55 14.3	5.6	5.5	0.40	18	23 35	23 21 16.51	5 44 6.1	5.2	5.1	0.34
Feb. 1	22 49	19 38 19.53	21 45 41.6	5.6	5.5	0.40	19	23 35	23 25 52.68	5 15 2.6	5.2	5.1	0.34
2	22 51	19 43 39.27	21 35 29.6	5.6	5.5	0.39	20	23 36	23 30 28.34	4 45 50.7	5.2	5.1	0.34
3	22 52	19 48 58.23	21 24 38.6	5.6	5.5	0.39	21	23 37	23 35 3.53	4 16 30.8	5.2	5.0	0.34
4	22 53	19 54 16.35	-21 13 8.8	5.6	5.4	0.39	22	23 37	23 39 38.28	-3 47 3.8	5.2	5.0	0.34
5	22 55	19 59 33.61	21 1 1.1	5.6	5.4	0.39	23	23 38	23 44 12.64	3 17 30.4	5.2	5.0	0.34
6	22 56	20 4 49.96	20 48 15.6	5.6	5.4	0.38	24	23 39	23 48 46.63	2 47 51.3	5.2	5.0	0.34
7	22 57	20 10 5.38	20 34 53.0	5.6	5.4	0.38	25	23 39	23 53 20.31	2 18 7.4	5.2	5.0	0.33
8	22 59	20 15 19.83	20 20 53.6	5.5	5.4	0.38	26	23 40	23 57 53.70	1 48 19.2	5.2	5.0	0.33
9	23 0	20 20 33.29	-20 6 18.2	5.5	5.4	0.38	27	23 40	0 2 26.84	-1 18 27.6	5.2	5.0	0.33
10	23 1	20 25 45.72	19 51 7.2	5.5	5.4	0.38	28	23 41	0 6 59.79	0 48 33.2	5.2	5.0	0.33
11	23 2	20 30 57.11	19 35 21.2	5.5	5.4	0.38	29	23 42	0 11 32.57	-0 18 36.8	5.2	5.0	0.33
12	23 4	20 36 7.44	19 19 0.7	5.5	5.3	0.38	30	23 42	0 16 5.24	+ 0 11 21.0	5.2	5.0	0.33
13	23 5	20 41 16.69	19 2 6.5	5.5	5.3	0.38	31	23 43	0 20 37.83	0 41 19.4	5.1	5.0	0.33
14	23 6	20 46 24.84	-18 44 38.9	5.5	5.3	0.38	Apr. 1	23 43	0 25 10.39	+ 1 11 17.7	5.1	5.0	0.33
15	23 7	20 51 31.88	-18 26 38.9	5.5	5.3	0.38	2	23 44	0 29 42.95	+ 1 41 15.3	5.1	5.0	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	23 43	0 25 10.39	+ 1 11 17.7	5.1	5.0	0.33	May 18	0 21	4 4 17.73	+20 40 33.9	5.1	5.0	0.35
2	23 44	0 29 42.95	1 41 15.3	5.1	5.0	0.33	19	0 22	4 9 26.26	20 56 50.9	5.1	5.0	0.35
3	23 45	0 34 15.56	2 11 11.4	5.1	5.0	0.33	20	0 23	4 14 35.84	21 12 33.3	5.1	5.0	0.35
4	23 45	0 38 48.28	2 41 5.3	5.1	5.0	0.33	21	0 25	4 19 46.46	21 27 40.4	5.1	5.0	0.36
5	23 46	0 43 21.13	3 10 56.3	5.1	5.0	0.33	22	0 26	4 24 58.08	21 42 11.7	5.1	5.0	0.36
6	23 46	0 47 54.17	+ 3 40 43.7	5.1	5.0	0.33	23	0 27	4 30 10.69	+21 56 6.4	5.1	5.0	0.36
7	23 47	0 52 27.42	4 10 26.8	5.1	5.0	0.33	24	0 28	4 35 24.24	22 9 24.2	5.1	5.0	0.36
8	23 48	0 57 0.94	4 40 5.0	5.1	5.0	0.33	25	0 30	4 40 38.71	22 22 4.5	5.1	5.0	0.36
9	23 48	1 1 34.78	5 9 37.4	5.1	5.0	0.33	26	0 31	4 45 54.06	22 34 6.7	5.1	5.0	0.36
10	23 49	1 6 8.96	5 39 3.3	5.1	5.0	0.33	27	0 32	4 51 10.26	22 45 30.2	5.2	5.0	0.36
11	23 49	1 10 43.54	+ 6 8 22.2	5.1	5.0	0.33	28	0 34	4 56 27.24	+22 56 14.6	5.2	5.0	0.36
12	23 50	1 15 18.55	6 37 33.1	5.1	5.0	0.33	29	0 35	5 1 44.98	23 6 19.5	5.2	5.0	0.36
13	23 51	1 19 54.04	7 6 35.4	5.1	5.0	0.33	30	0 36	5 7 3.44	23 15 44.6	5.2	5.0	0.36
14	23 51	1 24 30.04	7 35 28.5	5.1	5.0	0.33	31	0 38	5 12 22.58	23 24 29.2	5.2	5.0	0.37
15	23 52	1 29 6.59	8 4 11.4	5.1	5.0	0.33	June 1	0 39	5 17 42.33	23 32 33.0	5.2	5.0	0.37
16	23 53	1 33 43.74	+ 8 32 43.6	5.1	5.0	0.33	2	0 41	5 23 2.64	+23 39 55.8	5.2	5.0	0.37
17	23 53	1 38 21.52	9 1 4.2	5.1	5.0	0.33	3	0 42	5 28 23.48	23 46 37.0	5.2	5.0	0.37
18	23 54	1 42 59.94	9 29 12.6	5.1	5.0	0.33	4	0 43	5 33 44.80	23 52 36.5	5.2	5.0	0.37
19	23 55	1 47 39.06	9 57 7.9	5.1	5.0	0.33	5	0 45	5 39 6.52	23 57 54.0	5.2	5.1	0.37
20	23 56	1 52 18.91	10 24 49.5	5.1	5.0	0.34	6	0 46	5 44 28.62	24 2 29.3	5.2	5.1	0.37
21	23 56	1 56 59.51	+10 52 16.5	5.1	5.0	0.34	7	0 48	5 49 51.02	+24 6 22.0	5.2	5.1	0.37
22	23 57	2 1 40.90	11 19 28.2	5.1	5.0	0.34	8	0 49	5 55 13.67	24 9 32.0	5.2	5.1	0.37
23	23 58	2 6 23.11	11 46 23.9	5.1	5.0	0.34	9	0 50	6 0 36.53	24 11 59.2	5.2	5.1	0.37
24	23 59	2 11 6.16	12 13 2.8	5.1	5.0	0.34	10	0 52	6 5 59.51	24 13 43.3	5.2	5.1	0.37
25	23 59	2 15 50.08	12 39 24.2	5.1	5.0	0.34	11	0 53	6 11 22.58	24 14 44.3	5.3	5.1	0.37
27	0 0	2 20 34.90	+13 5 27.3	5.1	5.0	0.34	12	0 55	6 16 45.67	+24 15 2.2	5.3	5.1	0.37
28	0 1	2 25 20.64	13 31 11.4	5.1	5.0	0.34	13	0 56	6 22 8.72	24 14 37.0	5.3	5.1	0.37
29	0 2	2 30 7.33	13 56 35.8	5.1	5.0	0.34	14	0 58	6 27 31.65	24 13 28.4	5.3	5.1	0.37
30	0 3	2 34 55.01	14 21 39.7	5.1	5.0	0.34	15	0 59	6 32 54.42	24 11 36.8	5.3	5.1	0.37
May 1	0 3	2 39 43.67	14 46 22.4	5.1	5.0	0.34	16	1 1	6 38 16.96	24 9 1.9	5.3	5.1	0.37
2	0 4	2 44 33.35	+15 10 43.1	5.1	5.0	0.34	17	1 2	6 43 39.21	+24 5 44.2	5.3	5.1	0.37
3	0 5	2 49 24.06	15 34 41.1	5.1	5.0	0.34	18	1 3	6 49 1.10	24 1 43.6	5.3	5.2	0.37
4	0 6	2 54 15.84	15 58 15.6	5.1	5.0	0.34	19	1 5	6 54 22.58	23 57 0.3	5.3	5.2	0.37
5	0 7	2 59 8.69	16 21 26.0	5.1	5.0	0.34	20	1 6	6 59 43.60	23 51 34.4	5.3	5.2	0.38
6	0 8	3 4 2.64	16 44 11.5	5.1	5.0	0.34	21	1 8	7 5 4.08	23 45 26.1	5.3	5.2	0.38
7	0 9	3 8 57.67	+17 6 31.3	5.1	5.0	0.34	22	1 9	7 10 23.96	+23 38 36.0	5.4	5.2	0.38
8	0 10	3 13 53.82	17 28 24.8	5.1	5.0	0.34	23	1 10	7 15 43.19	23 31 4.1	5.4	5.2	0.38
9	0 11	3 18 51.10	17 49 51.3	5.1	5.0	0.34	24	1 12	7 21 1.72	23 22 50.7	5.4	5.2	0.38
10	0 12	3 23 49.52	18 10 50.0	5.1	5.0	0.35	25	1 13	7 26 19.48	23 13 56.4	5.4	5.2	0.38
11	0 13	3 28 49.07	18 31 20.1	5.1	5.0	0.35	26	1 14	7 31 36.44	23 4 21.4	5.4	5.2	0.38
12	0 14	3 33 49.77	+18 51 21.1	5.1	5.0	0.35	27	1 16	7 36 52.55	+22 54 6.1	5.4	5.2	0.38
13	0 15	3 38 51.61	19 10 52.1	5.1	5.0	0.35	28	1 17	7 42 7.76	22 43 10.9	5.4	5.2	0.38
14	0 16	3 43 54.58	19 29 52.4	5.1	5.0	0.35	29	1 18	7 47 22.01	22 31 36.3	5.4	5.3	0.38
15	0 18	3 48 58.70	19 48 21.5	5.1	5.0	0.35	30	1 20	7 52 35.29	22 19 22.8	5.4	5.3	0.38
16	0 19	3 54 3.93	20 6 18.5	5.1	5.0	0.35	July 1	1 21	7 57 47.53	22 6 30.9	5.5	5.3	0.38
17	0 20	3 59 10.28	+20 23 42.9	5.1	5.0	0.35	2	1 22	8 2 58.73	+21 53 0.8	5.5	5.3	0.38
18	0 21	4 4 17.73	+20 40 33.9	5.1	5.0	0.35	3	1 23	8 8 8.84	+21 38 53.4	5.5	5.3	0.38

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
July	h m	h m s	° ' "	"	"	s	Aug. 16	h m	h m s	° ' "	"	"	s
1	1 21	7 57 47.53	+22 6 30.9	5.5	5.3	0.38	1	58	11 36 23.36	+ 3 45 3.3	6.3	6.1	0.41
2	1 22	8 2 58.73	21 53 0.8	5.5	5.3	0.38	17	1 58	11 40 46.94	3 14 25.9	6.3	6.1	0.41
3	1 23	8 8 8.84	21 38 53.4	5.5	5.3	0.38	18	1 59	11 45 10.09	2 43 42.8	6.4	6.2	0.41
4	1 25	8 13 17.83	21 24 9.0	5.5	5.3	0.38	19	1 59	11 49 32.86	2 12 54.8	6.4	6.2	0.41
5	1 26	8 18 25.68	21 8 48.4	5.5	5.3	0.38	20	2 0	11 53 55.31	1 42 2.4	6.4	6.2	0.41
6	1 27	8 23 32.37	+20 52 52.0	5.5	5.3	0.38	21	2 0	11 58 17.45	+ 1 11 6.4	6.4	6.2	0.42
7	1 28	8 28 37.88	20 36 20.3	5.5	5.4	0.38	22	2 1	12 2 39.33	0 40 7.5	6.5	6.3	0.42
8	1 29	8 33 42.18	20 19 13.9	5.5	5.4	0.38	23	2 1	12 7 0.99	+ 0 9 6.4	6.5	6.3	0.42
9	1 30	8 38 45.26	20 1 33.7	5.6	5.4	0.38	24	2 1	12 11 22.46	- 0 21 56.1	6.5	6.3	0.42
10	1 31	8 43 47.10	19 43 20.0	5.6	5.4	0.38	25	2 2	12 15 43.78	0 52 59.4	6.5	6.3	0.42
11	1 32	8 48 47.72	+19 24 33.6	5.6	5.4	0.38	26	2 2	12 20 5.00	- 1 24 3.0	6.6	6.4	0.42
12	1 33	8 53 47.07	19 5 15.2	5.6	5.4	0.38	27	2 3	12 24 26.15	1 55 5.8	6.6	6.4	0.43
13	1 35	8 58 45.17	18 45 25.4	5.6	5.4	0.38	28	2 3	12 28 47.28	2 26 7.4	6.6	6.4	0.43
14	1 35	9 3 41.99	18 25 4.8	5.6	5.5	0.38	29	2 3	12 33 8.41	2 57 7.0	6.7	6.5	0.43
15	1 36	9 8 37.55	18 4 14.2	5.6	5.5	0.38	30	2 4	12 37 29.59	3 28 3.9	6.7	6.5	0.43
16	1 37	9 13 31.85	+17 42 54.3	5.7	5.5	0.38	31	2 4	12 41 50.86	- 3 58 57.5	6.7	6.5	0.44
17	1 38	9 18 24.88	17 21 5.7	5.7	5.5	0.38	Sept. 1	2 5	12 46 12.27	4 29 47.2	6.8	6.6	0.44
18	1 39	9 23 16.64	16 58 49.2	5.7	5.5	0.38	2	5	12 50 33.87	5 03 2.2	6.8	6.6	0.44
19	1 40	9 28 7.13	16 36 5.5	5.7	5.5	0.38	3	2	12 54 55.68	5 31 11.8	6.8	6.6	0.44
20	1 41	9 32 56.36	16 12 55.4	5.7	5.6	0.39	4	2	12 59 17.76	6 1 45.6	6.9	6.7	0.45
21	1 42	9 37 44.36	+15 49 19.6	5.7	5.6	0.39	5	2	13 3 40.13	- 6 32 12.6	6.9	6.7	0.45
22	1 43	9 42 31.11	15 25 18.8	5.8	5.6	0.39	6	2	13 8 2.85	7 2 32.4	6.9	6.7	0.45
23	1 44	9 47 16.64	15 0 53.8	5.8	5.6	0.39	7	2	13 12 25.97	7 32 44.1	7.0	6.8	0.46
24	1 44	9 52 0.95	14 36 5.2	5.8	5.6	0.39	8	2	13 16 49.51	8 2 47.1	7.0	6.8	0.46
25	1 45	9 56 44.07	14 10 53.8	5.8	5.6	0.39	9	2	13 21 13.52	8 32 40.6	7.0	6.8	0.46
26	1 46	10 1 26.01	+13 45 20.4	5.8	5.7	0.39	10	2	13 25 38.01	- 9 2 24.0	7.1	6.9	0.46
27	1 47	10 6 6.79	13 19 25.7	5.9	5.7	0.39	11	2	13 30 3.05	9 31 56.6	7.1	6.9	0.47
28	1 47	10 10 46.44	12 53 10.6	5.9	5.7	0.39	12	2	13 34 28.87	10 1 17.7	7.1	6.9	0.47
29	1 48	10 15 24.96	12 26 35.5	5.9	5.7	0.39	13	2	13 38 54.88	10 30 26.5	7.2	7.0	0.47
30	1 49	10 20 2.40	11 59 41.4	5.9	5.7	0.39	14	2	13 43 21.74	10 59 22.4	7.2	7.0	0.47
31	1 49	10 24 38.78	+11 32 28.8	5.9	5.8	0.39	15	2	13 47 49.28	-11 28 4.6	7.3	7.1	0.48
Aug. 1	1 50	10 29 14.12	11 4 58.6	6.0	5.8	0.39	16	2	13 52 17.50	11 56 32.3	7.3	7.1	0.48
2	1 51	10 33 48.44	10 37 11.4	6.0	5.8	0.39	17	2	13 56 46.46	12 24 44.9	7.3	7.1	0.48
3	1 51	10 38 21.80	10 9 8.1	6.0	5.8	0.39	18	2	13 14 116.17	12 52 41.7	7.4	7.2	0.49
4	1 52	10 42 54.22	9 40 49.1	6.0	5.8	0.39	19	2	13 14 5 46.65	13 20 21.9	7.4	7.2	0.49
5	1 52	10 47 25.74	+ 9 12 15.4	6.0	5.9	0.40	20	2	14 10 17.94	-13 47 44.6	7.5	7.3	0.49
6	1 53	10 51 56.39	8 43 27.5	6.1	5.9	0.40	21	2	14 14 50.05	14 14 49.2	7.5	7.3	0.50
7	1 54	10 56 26.21	8 14 26.1	6.1	5.9	0.40	22	2	14 19 23.01	14 41 35.2	7.5	7.3	0.50
8	1 54	11 0 55.24	7 45 11.9	6.1	5.9	0.40	23	2	14 23 56.83	15 8 1.6	7.6	7.4	0.50
9	1 55	11 5 23.51	7 15 45.7	6.1	5.9	0.40	24	2	14 28 31.54	15 34 7.7	7.6	7.4	0.51
10	1 55	11 9 51.06	+ 6 46 8.1	6.2	6.0	0.40	25	2	14 33 7.14	-15 59 52.9	7.7	7.5	0.51
11	1 56	11 14 17.92	6 16 19.8	6.2	6.0	0.40	26	2	14 37 43.65	16 25 16.2	7.7	7.5	0.52
12	1 56	11 18 44.15	5 46 21.7	6.2	6.0	0.40	27	2	14 42 21.09	16 50 17.2	7.8	7.6	0.52
13	1 57	11 23 9.76	5 16 14.1	6.2	6.0	0.40	28	2	14 46 59.47	17 14 55.1	7.8	7.6	0.53
14	1 57	11 27 34.81	4 45 58.2	6.3	6.1	0.41	29	2	14 51 38.80	17 39 9.0	7.9	7.7	0.53
15	1 58	11 31 59.33	+ 4 15 34.3	6.3	6.1	0.41	30	2	14 56 19.08	-18 2 58.4	7.9	7.7	0.54
16	1 58	11 36 23.36	+ 3 45 3.3	6.3	6.1	0.41	Oct. 1	2 21	15 1 0.34	-18 26 22.5	8.0	7.7	0.54

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. "	S. T. of Sem. Pass. Mer. s	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. "	S. T. of Sem. Pass. Mer. s
Oct.	h m	h m s	° ' "	"	"	s	Nov. 15	h m	h m s	° ' "	"	"	s
1	2 21	15 1 0.34	-18 26 22.5	8.0	7.7	0.54	3	5	18 42 22.93	-26 8 46.8	11.3	11.0	0.81
2	2 22	15 5 42.58	18 49 20.8	8.0	7.8	0.55	16	3	6 18 47 12.08	26 3 58.2	11.4	11.1	0.82
3	2 23	15 10 25.80	19 11 52.3	8.1	7.8	0.55	17	3	7 18 51 59.73	25 58 30.7	11.5	11.2	0.83
4	2 23	15 15 10.02	19 33 56.7	8.1	7.9	0.56	18	3	8 18 56 45.81	25 52 24.7	11.6	11.3	0.83
5	2 24	15 19 55.23	19 55 32.9	8.2	8.0	0.56	19	3	8 19 1 30.23	25 45 40.8	11.7	11.4	0.84
6	2 25	15 24 41.43	-20 16 40.5	8.2	8.0	0.57	20	3	9 19 6 12.88	-25 38 19.3	11.9	11.6	0.85
7	2 26	15 29 28.62	20 37 18.7	8.3	8.0	0.57	21	3	10 19 10 53.69	25 30 20.8	12.0	11.7	0.86
8	2 27	15 34 16.79	20 57 26.8	8.3	8.1	0.58	22	3	11 19 15 32.56	25 21 46.0	12.1	11.8	0.87
9	2 28	15 39 5.93	21 17 4.2	8.4	8.2	0.58	23	3	11 19 20 9.38	25 12 35.4	12.2	11.9	0.88
10	2 29	15 43 56.03	21 36 10.5	8.4	8.2	0.59	24	3	12 19 24 44.09	25 2 49.6	12.4	12.0	0.88
11	2 29	15 48 47.07	-21 54 44.6	8.5	8.3	0.59	25	3	12 19 29 16.61	-24 52 29.4	12.5	12.1	0.89
12	2 30	15 53 39.03	22 12 46.0	8.6	8.3	0.60	26	3	13 19 33 46.83	24 41 35.2	12.6	12.3	0.90
13	2 31	15 58 31.87	22 30 14.3	8.6	8.4	0.60	27	3	14 19 38 14.69	24 30 7.8	12.8	12.4	0.91
14	2 32	16 3 25.60	22 47 8.6	8.7	8.5	0.61	28	3	14 19 42 40.09	24 18 8.1	12.9	12.5	0.92
15	2 33	16 8 20.15	23 3 28.4	8.7	8.5	0.62	29	3	14 19 47 2.98	24 5 36.6	13.1	12.7	0.93
16	2 34	16 13 15.51	-23 19 13.3	8.8	8.5	0.62	30	3	15 19 51 23.28	-23 52 34.2	13.2	12.8	0.94
17	2 35	16 18 11.65	23 34 22.4	8.9	8.6	0.63	Dec. 1	3	15 19 55 40.89	23 39 1.7	13.4	13.0	0.94
18	2 36	16 23 8.50	23 48 55.4	8.9	8.7	0.63	2	3	15 19 59 55.78	23 24 59.7	13.5	13.1	0.95
19	2 37	16 28 6.02	24 2 51.7	9.0	8.7	0.64	3	3	16 20 4 7.84	23 10 29.2	13.7	13.3	0.96
20	2 38	16 33 4.16	24 16 10.8	9.1	8.8	0.64	4	3	16 20 8 17.03	22 55 30.8	13.8	13.4	0.97
21	2 39	16 38 2.88	-24 28 52.4	9.1	8.9	0.65	5	3	16 20 12 23.24	-22 40 5.7	14.0	13.6	0.98
22	2 40	16 43 2.12	24 40 55.8	9.2	8.9	0.65	6	3	16 20 16 26.42	22 24 14.6	14.2	13.8	0.99
23	2 41	16 48 1.81	24 52 20.6	9.3	9.0	0.66	7	3	16 20 20 26.47	22 7 58.4	14.3	13.9	1.00
24	2 42	16 53 1.90	25 3 6.6	9.3	9.1	0.67	8	3	16 20 24 23.36	21 51 17.8	14.5	14.1	1.01
25	2 44	16 58 2.33	25 13 13.3	9.4	9.1	0.68	9	3	16 20 28 16.97	21 34 14.2	14.7	14.3	1.02
26	2 45	17 3 3.02	-25 22 40.3	9.5	9.2	0.68	10	3	16 20 32 7.25	-21 16 48.1	14.9	14.5	1.03
27	2 46	17 8 3.93	25 31 27.5	9.6	9.3	0.69	11	3	16 20 35 54.08	20 59 0.8	15.1	14.6	1.04
28	2 47	17 13 4.97	25 39 34.3	9.6	9.4	0.69	12	3	16 20 39 37.42	20 40 53.1	15.2	14.8	1.05
29	2 48	17 18 6.08	25 47 0.8	9.7	9.4	0.70	13	3	16 20 43 17.15	20 22 26.1	15.4	15.0	1.06
30	2 49	17 23 7.18	25 53 46.5	9.8	9.5	0.71	14	3	16 20 46 53.20	20 3 41.1	15.6	15.2	1.07
31	2 50	17 28 8.22	-25 59 51.5	9.9	9.6	0.71	15	3	16 20 50 25.47	-19 44 38.8	15.9	15.4	1.08
Nov. 1	2 51	17 33 9.12	26 5 15.3	10.0	9.7	0.72	16	3	14 20 53 53.86	19 25 20.6	16.1	15.6	1.10
2	2 52	17 38 9.80	26 9 57.9	10.1	9.8	0.73	17	3	14 20 57 18.25	19 5 47.4	16.3	15.8	1.11
3	2 53	17 43 10.19	26 13 59.3	10.1	9.8	0.74	18	3	13 21 0 38.56	18 46 0.7	16.5	16.0	1.13
4	2 54	17 48 10.20	26 17 19.3	10.2	9.9	0.74	19	3	12 21 3 54.65	18 26 1.4	16.7	16.2	1.14
5	2 55	17 53 9.78	-26 19 58.0	10.3	10.0	0.75	20	3	12 21 7 6.42	-18 5 50.9	17.0	16.5	1.16
6	2 56	17 58 8.83	26 21 55.2	10.4	10.1	0.76	21	3	11 21 10 13.75	17 45 30.3	17.2	16.7	1.17
7	2 57	18 3 7.29	26 23 11.2	10.5	10.2	0.76	22	3	10 21 13 16.53	17 25 1.0	17.5	17.0	1.19
8	2 58	18 8 5.05	26 23 45.7	10.6	10.3	0.77	23	3	9 21 16 14.61	17 4 24.0	17.7	17.2	1.20
9	2 59	18 13 2.04	26 23 39.3	10.7	10.4	0.77	24	3	8 21 19 7.87	16 43 40.8	18.0	17.5	1.22
10	3 0	18 17 58.17	-26 22 51.8	10.8	10.5	0.78	25	3	7 21 21 56.19	-16 22 52.6	18.2	17.7	1.23
11	3 1	18 22 53.36	26 21 23.5	10.9	10.6	0.79	26	3	6 21 24 39.43	16 2 0.8	18.5	18.0	1.25
12	3 2	18 27 47.52	26 19 14.5	11.0	10.7	0.79	27	3	4 21 27 17.44	15 41 6.6	18.8	18.3	1.27
13	3 3	18 32 40.56	26 16 25.1	11.1	10.8	0.80	28	3	3 21 29 50.09	15 20 11.4	19.1	18.5	1.28
14	3 4	18 37 32.40	26 12 55.8	11.2	10.9	0.80	29	3	1 21 32 17.23	14 59 16.4	19.4	18.8	1.30
15	3 5	18 42 22.93	-26 8 46.8	11.3	11.0	0.81	30	3	0 21 34 38.73	-14 38 23.3	19.7	19.1	1.31
16	3 6	18 47 12.08	26 3 58.2	11.4	11.1	0.82	31	2	58 21 36 54.40	-14 17 33.4	20.0	19.4	1.33

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Sept. 30	20 19	8 57 58.99	+18 26 40.8	4.6	2.6	0.18	Nov. 15	18 59	10 39 21.99	+10 29 43.5	5.6	3.2	0.22
Oct. 1	20 18	9 0 24.95	18 17 21.9	4.6	2.6	0.19	16	18 57	10 41 18.96	10 19 8.2	5.7	3.2	0.22
2	20 16	9 2 50.33	18 7 58.0	4.6	2.6	0.19	17	18 55	10 43 15.20	10 8 34.8	5.7	3.3	0.22
3	20 15	9 5 15.14	17 58 29.3	4.6	2.6	0.19	18	18 53	10 45 10.73	9 58 3.3	5.7	3.3	0.22
4	20 13	9 7 39.38	17 48 56.0	4.6	2.7	0.19	19	18 51	10 47 5.51	9 47 34.1	5.8	3.3	0.22
5	20 12	9 10 3.03	+17 39 18.0	4.7	2.7	0.19	20	18 49	10 48 59.55	+ 9 37 7.1	5.8	3.3	0.22
6	20 10	9 12 26.09	17 29 35.8	4.7	2.7	0.19	21	18 47	10 50 52.83	9 26 42.6	5.8	3.3	0.23
7	20 8	9 14 48.57	17 19 49.3	4.7	2.7	0.19	22	18 45	10 52 45.37	9 16 20.7	5.9	3.4	0.23
8	20 7	9 17 10.45	17 9 58.8	4.7	2.7	0.19	23	18 43	10 54 37.13	9 6 1.6	5.9	3.4	0.23
9	20 5	9 19 31.74	17 0 4.3	4.7	2.7	0.19	24	18 41	10 56 28.15	8 55 45.2	5.9	3.4	0.23
10	20 4	9 21 52.44	+16 50 6.0	4.7	2.7	0.19	25	18 39	10 58 18.41	+ 8 45 32.0	6.0	3.4	0.23
11	20 2	9 24 12.52	16 40 4.2	4.8	2.7	0.19	26	18 37	11 0 7.88	8 35 21.9	6.0	3.4	0.23
12	20 0	9 26 32.01	16 29 58.8	4.8	2.7	0.19	27	18 35	11 1 56.58	8 25 15.0	6.0	3.5	0.23
13	19 59	9 28 50.90	16 19 50.1	4.8	2.8	0.19	28	18 33	11 3 44.48	8 15 11.8	6.1	3.5	0.23
14	19 57	9 31 9.18	16 9 38.4	4.8	2.8	0.19	29	18 30	11 5 31.57	8 5 12.0	6.1	3.5	0.24
15	19 56	9 33 26.84	+15 59 23.5	4.8	2.8	0.19	30	18 28	11 7 17.86	+ 7 55 16.0	6.2	3.5	0.24
16	19 54	9 35 43.87	15 49 5.8	4.9	2.8	0.19	Dec. 1	18 26	11 9 3.33	7 45 24.0	6.2	3.6	0.24
17	19 52	9 38 0.30	15 38 45.5	4.9	2.8	0.19	2	18 24	11 10 47.95	7 35 36.1	6.2	3.6	0.24
18	19 51	9 40 16.10	15 28 22.6	4.9	2.8	0.19	3	18 22	11 12 31.72	7 25 52.7	6.3	3.6	0.24
19	19 49	9 42 31.27	15 17 57.4	4.9	2.8	0.19	4	18 19	11 14 14.62	7 16 13.8	6.3	3.6	0.24
20	19 47	9 44 45.82	+15 7 29.8	4.9	2.8	0.20	5	18 17	11 15 56.64	+ 7 6 39.6	6.4	3.6	0.25
21	19 45	9 46 59.76	14 57 0.0	5.0	2.9	0.20	6	18 15	11 17 37.77	6 57 10.3	6.4	3.7	0.25
22	19 44	9 49 13.08	14 46 28.3	5.0	2.9	0.20	7	18 13	11 19 17.99	6 47 46.2	6.5	3.7	0.25
23	19 42	9 51 25.76	14 35 54.7	5.0	2.9	0.20	8	18 10	11 20 57.27	6 38 27.4	6.5	3.7	0.25
24	19 40	9 53 37.82	14 25 19.2	5.0	2.9	0.20	9	18 8	11 22 35.61	6 29 14.0	6.5	3.8	0.25
25	19 39	9 55 49.27	+14 14 42.1	5.1	2.9	0.20	10	18 6	11 24 12.98	+ 6 20 6.3	6.6	3.8	0.25
26	19 37	9 58 0.08	14 4 3.6	5.1	2.9	0.20	11	18 4	11 25 49.36	6 11 4.4	6.6	3.8	0.26
27	19 35	10 0 10.27	13 53 23.7	5.1	2.9	0.20	12	18 1	11 27 24.74	6 2 8.6	6.7	3.8	0.26
28	19 33	10 2 19.83	13 42 42.6	5.1	2.9	0.20	13	17 59	11 28 59.09	5 53 19.1	6.7	3.9	0.26
29	19 31	10 4 28.79	13 32 0.4	5.1	2.9	0.20	14	17 56	11 30 32.41	5 44 36.0	6.8	3.9	0.26
30	19 30	10 6 37.12	+13 21 17.2	5.2	3.0	0.20	15	17 54	11 32 4.66	+ 5 35 59.5	6.8	3.9	0.26
31	19 28	10 8 44.81	13 10 33.2	5.2	3.0	0.20	16	17 52	11 33 35.84	5 27 29.8	6.9	3.9	0.26
Nov. 1	19 26	10 10 51.89	12 59 48.6	5.2	3.0	0.20	17	17 49	11 35 5.92	5 19 6.9	6.9	4.0	0.27
2	19 24	10 12 58.33	12 49 3.5	5.3	3.0	0.21	18	17 47	11 36 34.88	5 10 51.3	7.0	4.0	0.27
3	19 22	10 15 4.14	12 38 18.0	5.3	3.0	0.21	19	17 44	11 38 2.72	5 2 43.0	7.0	4.0	0.27
4	19 20	10 17 9.30	+12 27 32.2	5.3	3.0	0.21	20	17 42	11 39 29.40	+ 4 54 42.0	7.1	4.1	0.27
5	19 19	10 19 13.81	12 16 46.5	5.3	3.1	0.21	21	17 39	11 40 54.92	4 46 48.7	7.2	4.1	0.27
6	19 17	10 21 17.68	12 6 0.8	5.4	3.1	0.21	22	17 37	11 42 19.26	4 39 3.2	7.2	4.1	0.28
7	19 15	10 23 20.88	11 55 15.5	5.4	3.1	0.21	23	17 34	11 43 42.39	4 31 25.7	7.3	4.2	0.28
8	19 13	10 25 23.41	11 44 30.7	5.4	3.1	0.21	24	17 32	11 45 4.29	4 23 56.3	7.3	4.2	0.28
9	19 11	10 27 25.28	+11 33 46.6	5.4	3.1	0.21	25	17 29	11 46 24.94	+ 4 16 35.1	7.4	4.2	0.28
10	19 9	10 29 26.47	11 23 3.1	5.5	3.1	0.21	26	17 26	11 47 44.32	4 9 22.5	7.4	4.3	0.29
11	19 7	10 31 26.98	11 12 20.6	5.5	3.2	0.21	27	17 24	11 49 2.40	4 2 18.6	7.5	4.3	0.29
12	19 5	10 33 26.78	11 1 39.3	5.5	3.2	0.22	28	17 21	11 50 19.16	3 55 23.7	7.6	4.3	0.29
13	19 3	10 35 25.89	10 50 59.2	5.6	3.2	0.22	29	17 18	11 51 34.55	3 48 38.0	7.6	4.4	0.29
14	19 1	10 37 24.29	+10 40 20.6	5.6	3.2	0.22	30	17 16	11 52 48.57	+ 3 42 1.8	7.7	4.4	0.29
15	18 59	10 39 21.99	+10 29 43.5	5.6	3.2	0.22	31	17 13	11 54 1.17	+ 3 35 35.2	7.7	4.4	0.30

Stellar magnitude at opposition in March, 1918, -1.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semi-diam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semi-diam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	" s			h m s	h m s	° ' "	"	" s	
Jan. 1	6 53	1 37 2.41	+ 8 45 51.2	1.9	20.3	1.46	Aug. 17	18 43	4 28 6.59	+20 54 14.9	1.7	18.2	1.39
2	6 49	1 37 11.70	8 47 4.7	1.9	20.3	1.46	18	18 40	4 28 38.52	20 55 21.4	1.7	18.3	1.39
3	6 45	1 37 21.75	8 48 22.5	1.9	20.2	1.45	19	18 36	4 29 9.84	20 56 26.0	1.7	18.3	1.39
4	6 42	1 37 32.55	8 49 44.4	1.9	20.1	1.45	20	18 33	4 29 40.56	20 57 28.9	1.7	18.4	1.40
5	6 38	1 37 44.08	8 51 10.6	1.9	20.1	1.44	21	18 29	4 30 10.67	20 58 30.0	1.7	18.4	1.40
6	6 34	1 37 56.35	+ 8 52 41.1	1.9	20.0	1.44	22	18 26	4 30 40.14	+20 59 29.5	1.7	18.5	1.41
7	6 30	1 38 9.35	8 54 15.6	1.9	19.9	1.43	23	18 22	4 31 8.99	21 0 27.2	1.7	18.5	1.41
8	6 27	1 38 23.08	8 55 54.0	1.9	19.9	1.43	24	18 19	4 31 37.20	21 1 23.1	1.7	18.6	1.41
9	6 23	1 38 37.53	8 57 36.6	1.8	19.8	1.42	25	18 15	4 32 4.76	21 2 17.4	1.7	18.6	1.42
10	6 19	1 38 52.71	8 59 23.1	1.8	19.7	1.42	26	18 12	4 32 31.68	21 3 10.0	1.8	18.7	1.42
11	6 16	1 39 8.59	+ 9 1 13.6	1.8	19.7	1.41	27	18 9	4 32 57.93	+21 4 0.8	1.8	18.8	1.43
12	6 12	1 39 25.18	9 3 7.9	1.8	19.6	1.41	28	18 5	4 33 23.52	21 4 50.1	1.8	18.8	1.43
13	6 8	1 39 42.47	9 5 6.1	1.8	19.5	1.40	29	18 2	4 33 48.43	21 5 57.5	1.8	18.9	1.44
14	6 5	1 40 0.46	9 7 8.1	1.8	19.5	1.40	30	17 58	4 34 12.66	21 6 23.4	1.8	18.9	1.44
15	6 1	1 40 19.12	9 9 13.9	1.8	19.4	1.40	31	17 54	4 34 36.21	21 7 7.5	1.8	19.0	1.45
16	5 57	1 40 38.49	+ 9 11 23.4	1.8	19.3	1.39	Sept. 1	17 51	4 34 59.05	+21 7 49.9	1.8	19.1	1.45
17	5 54	1 40 58.53	9 13 36.5	1.8	19.3	1.39	2	17 47	4 35 21.20	21 8 30.7	1.8	19.1	1.45
18	5 50	1 41 19.25	9 15 53.4	1.8	19.2	1.38	3	17 44	4 35 42.65	21 9 9.9	1.8	19.2	1.46
19	5 47	1 41 40.63	9 18 13.9	1.8	19.2	1.38	4	17 40	4 36 3.37	21 9 47.4	1.8	19.2	1.46
20	5 43	1 42 2.68	9 20 37.8	1.8	19.1	1.37	5	17 36	4 36 23.38	21 10 23.3	1.8	19.3	1.47
21	5 40	1 42 25.38	+ 9 23 5.3	1.8	19.0	1.37	6	17 33	4 36 42.64	+21 10 57.5	1.8	19.4	1.47
22	5 36	1 42 48.73	9 25 36.3	1.8	19.0	1.36	7	17 29	4 37 1.16	21 11 30.1	1.8	19.4	1.48
23	5 33	1 43 12.74	9 28 10.6	1.8	18.9	1.36	8	17 26	4 37 18.93	21 12 1.1	1.8	19.5	1.48
24	5 29	1 43 37.38	9 30 48.3	1.8	18.8	1.35	9	17 22	4 37 35.95	21 12 30.3	1.8	19.5	1.49
25	5 26	1 44 2.66	9 33 29.3	1.8	18.8	1.35	10	17 18	4 37 52.19	21 12 58.1	1.8	19.6	1.49
26	5 22	1 44 28.57	+ 9 36 13.5	1.8	18.7	1.35	11	17 15	4 38 7.67	+21 13 24.1	1.8	19.7	1.49
27	5 19	1 44 55.09	9 39 1.0	1.7	18.7	1.35	12	17 11	4 38 22.36	21 13 48.6	1.8	19.7	1.50
28	5 15	1 45 22.22	9 41 51.4	1.7	18.6	1.34	13	17 7	4 38 36.26	21 14 11.5	1.8	19.8	1.50
29	5 12	1 45 49.94	9 44 44.9	1.7	18.5	1.34	14	17 4	4 38 49.37	21 14 32.6	1.9	19.8	1.51
30	5 8	1 46 18.26	9 47 41.5	1.7	18.5	1.33	15	17 0	4 39 1.68	21 14 52.3	1.9	19.9	1.51
31	5 5	1 46 47.16	+ 9 50 41.0	1.7	18.4	1.33	16	16 56	4 39 13.18	+21 15 10.3	1.9	20.0	1.52
Feb. 1	5 1	1 47 16.65	9 53 43.4	1.7	18.4	1.33	17	16 52	4 39 23.88	21 15 26.8	1.9	20.0	1.52
2	4 58	1 47 46.69	9 56 48.5	1.7	18.3	1.32	18	16 49	4 39 33.77	21 15 41.5	1.9	20.1	1.53
3	4 54	1 48 17.31	9 59 56.4	1.7	18.3	1.32	19	16 45	4 39 42.83	21 15 54.8	1.9	20.2	1.53
4	4 51	1 48 48.49	10 3 7.1	1.7	18.2	1.32	20	16 41	4 39 51.07	21 16 6.5	1.9	20.2	1.54
5	4 48	1 49 20.21	+10 6 20.4	1.7	18.2	1.31	21	16 37	4 39 58.49	+21 16 16.6	1.9	20.3	1.54
6	4 44	1 49 52.48	10 9 36.3	1.7	18.1	1.31	22	16 33	4 40 5.08	21 16 25.1	1.9	20.4	1.55
7	4 41	1 50 25.27	10 12 54.8	1.7	18.1	1.30	23	16 30	4 40 10.83	21 16 32.1	1.9	20.4	1.55
8	4 37	1 50 58.59	10 16 15.7	1.7	18.0	1.30	24	16 26	4 40 15.75	21 16 37.4	1.9	20.5	1.56
9	4 34	1 51 32.45	10 19 39.1	1.7	17.9	1.29	25	16 22	4 40 19.82	21 16 41.2	1.9	20.5	1.56
10	4 31	1 52 6.82	+10 23 4.9	1.7	17.9	1.29	26	16 18	4 40 23.06	+21 16 43.5	1.9	20.6	1.57
11	4 27	1 52 41.70	10 26 33.0	1.7	17.8	1.29	27	16 14	4 40 25.45	21 16 44.2	1.9	20.7	1.57
12	4 24	1 53 17.07	10 30 3.5	1.7	17.8	1.29	28	16 10	4 40 27.00	21 16 43.3	1.9	20.7	1.58
13	4 20	1 53 52.95	10 33 36.2	1.7	17.8	1.29	29	16 6	4 40 27.71	21 16 40.8	1.9	20.8	1.59
14	4 17	1 54 29.31	10 37 11.2	1.7	17.7	1.28	30	16 2	4 40 27.58	21 16 36.8	2.0	20.9	1.60
Aug. 16	18 46	4 27 34.07	+20 53 6.8	1.7	18.2	1.38	Oct. 1	15 58	4 40 26.58	+21 16 31.3	2.0	20.9	1.60
17	18 43	4 28 6.59	+20 54 14.9	1.7	18.2	1.39	2	15 54	4 40 24.75	+21 16 24.2	2.0	21.0	1.61

Stellar magnitude at opposition in November, 1917, -2.4.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
Oct. 1	15 58	4 40 26.58	+21 16 31.3	2.0	20.9	1.60	Nov. 15	12 47	4 26 16.32	+20 46 46.6	2.2	23.1	1.75
2	15 54	4 40 24.75	21 16 24.2	2.0	21.0	1.61	16	12 43	4 25 43.74	20 45 37.7	2.2	23.1	1.75
3	15 50	4 40 22.06	21 16 15.5	2.0	21.1	1.61	17	12 38	4 25 10.87	20 44 27.9	2.2	23.1	1.75
4	15 46	4 40 18.52	21 16 5.3	2.0	21.1	1.61	18	12 34	4 24 37.73	20 43 17.4	2.2	23.1	1.76
5	15 42	4 40 14.13	21 15 53.6	2.0	21.2	1.62	19	12 29	4 24 4.34	20 42 6.1	2.2	23.1	1.76
6	15 38	4 40 8.88	+21 15 40.2	2.0	21.2	1.62	20	12 25	4 23 30.73	+20 40 54.2	2.2	23.2	1.76
7	15 34	4 40 2.77	21 15 25.3	2.0	21.3	1.63	21	12 20	4 22 56.93	20 39 41.5	2.2	23.2	1.76
8	15 30	4 39 55.82	21 15 8.9	2.0	21.4	1.63	22	12 16	4 22 22.97	20 38 28.4	2.2	23.2	1.76
9	15 26	4 39 48.01	21 14 50.8	2.0	21.4	1.63	23	12 11	4 21 48.86	20 37 14.7	2.2	23.2	1.76
10	15 22	4 39 39.35	21 14 31.3	2.0	21.5	1.64	24	12 7	4 21 14.64	20 36 0.5	2.2	23.2	1.76
11	15 18	4 39 29.83	+21 14 10.2	2.0	21.5	1.64	25	12 2	4 20 40.33	+20 34 45.9	2.2	23.2	1.76
12	15 14	4 39 19.49	21 13 47.5	2.0	21.6	1.65	26	11 58	4 20 5.96	20 33 30.9	2.2	23.2	1.76
13	15 10	4 39 8.31	21 13 23.4	2.0	21.7	1.65	27	11 53	4 19 31.57	20 32 15.7	2.2	23.2	1.76
14	15 6	4 38 56.29	21 12 57.7	2.0	21.7	1.66	28	11 49	4 18 57.13	20 31 0.1	2.2	23.2	1.76
15	15 2	4 38 43.44	21 12 30.4	2.0	21.8	1.66	29	11 44	4 18 22.73	20 29 44.5	2.2	23.2	1.76
16	14 58	4 38 29.78	+21 12 1.6	2.0	21.8	1.66	30	11 40	4 17 48.36	+20 28 28.7	2.2	23.2	1.76
17	14 53	4 38 15.30	21 11 31.4	2.0	21.9	1.67	Dec. 1	11 35	4 17 14.06	20 27 12.9	2.2	23.2	1.75
18	14 49	4 38 0.02	21 10 59.7	2.0	21.9	1.67	2	11 31	4 16 39.85	20 25 57.1	2.2	23.2	1.75
19	14 45	4 37 43.93	21 10 26.5	2.1	22.0	1.68	3	11 26	4 16 5.75	20 24 41.4	2.2	23.2	1.75
20	14 41	4 37 27.07	21 9 51.6	2.1	22.1	1.68	4	11 22	4 15 31.80	20 23 25.8	2.2	23.1	1.75
21	14 37	4 37 9.43	+21 9 15.3	2.1	22.1	1.68	5	11 17	4 14 58.01	+20 22 10.4	2.2	23.1	1.75
22	14 32	4 36 51.03	21 8 37.5	2.1	22.2	1.69	6	11 13	4 14 24.41	20 20 55.4	2.2	23.1	1.75
23	14 28	4 36 31.88	21 7 58.3	2.1	22.2	1.69	7	11 8	4 13 51.03	20 19 40.5	2.2	23.1	1.75
24	14 24	4 36 11.98	21 7 17.6	2.1	22.3	1.70	8	11 4	4 13 17.89	20 18 26.2	2.2	23.1	1.75
25	14 20	4 35 51.36	21 6 35.6	2.1	22.3	1.70	9	10 59	4 12 45.02	20 17 12.4	2.2	23.1	1.75
26	14 15	4 35 30.01	+21 5 52.0	2.1	22.4	1.70	10	10 55	4 12 12.45	+20 15 59.2	2.2	23.0	1.74
27	14 11	4 35 7.98	21 5 7.1	2.1	22.4	1.71	11	10 51	4 11 40.19	20 14 46.7	2.2	23.0	1.74
28	14 7	4 34 45.25	21 4 20.6	2.1	22.5	1.71	12	10 46	4 11 8.29	20 13 34.8	2.2	23.0	1.74
29	14 2	4 34 21.85	21 3 32.7	2.1	22.5	1.71	13	10 42	4 10 36.77	20 12 23.6	2.2	23.0	1.74
30	13 58	4 33 57.78	21 2 43.6	2.1	22.5	1.71	14	10 37	4 10 5.62	20 11 13.5	2.1	22.9	1.73
31	13 54	4 33 33.06	+21 1 53.1	2.1	22.6	1.72	15	10 33	4 9 34.90	+20 10 4.3	2.1	22.9	1.73
Nov. 1	13 49	4 33 7.70	21 1 1.2	2.1	22.6	1.72	16	10 28	4 9 4.63	20 8 56.0	2.1	22.9	1.73
2	13 45	4 32 41.74	21 0 8.0	2.1	22.7	1.72	17	10 24	4 8 34.82	20 7 48.8	2.1	22.8	1.73
3	13 40	4 32 15.16	20 59 3.5	2.1	22.7	1.73	18	10 19	4 8 5.51	20 6 42.6	2.1	22.8	1.72
4	13 36	4 31 48.01	20 58 17.8	2.1	22.7	1.73	19	10 15	4 7 36.69	20 5 37.8	2.1	22.8	1.72
5	13 32	4 31 20.29	+20 57 20.8	2.1	22.8	1.73	20	10 11	4 7 8.42	+20 4 34.3	2.1	22.7	1.72
6	13 27	4 30 52.02	20 56 22.5	2.1	22.8	1.74	21	10 6	4 6 40.68	20 3 32.0	2.1	22.7	1.71
7	13 23	4 30 23.21	20 55 22.9	2.1	22.8	1.74	22	10 2	4 6 13.52	20 2 31.2	2.1	22.6	1.71
8	13 18	4 29 53.91	20 54 22.2	2.1	22.9	1.74	23	9 57	4 5 46.94	20 1 31.8	2.1	22.6	1.71
9	13 14	4 29 24.11	20 53 20.3	2.1	22.9	1.74	24	9 53	4 5 20.96	20 0 33.9	2.1	22.5	1.71
10	13 10	4 28 53.85	+20 52 17.2	2.1	22.9	1.74	25	9 49	4 4 55.59	+19 59 37.6	2.1	22.5	1.70
11	13 5	4 28 23.14	20 51 13.0	2.2	23.0	1.74	26	9 44	4 4 30.85	19 58 42.8	2.1	22.5	1.70
12	13 1	4 27 52.00	20 50 7.9	2.2	23.0	1.75	27	9 40	4 4 6.76	19 57 49.9	2.1	22.4	1.69
13	12 56	4 27 20.48	20 49 1.7	2.2	23.0	1.75	28	9 36	4 3 43.33	19 56 58.7	2.1	22.4	1.69
14	12 52	4 26 48.57	20 47 54.6	2.2	23.0	1.75	29	9 32	4 3 20.59	19 56 9.3	2.1	22.3	1.69
15	12 47	4 26 16.32	+20 46 46.6	2.2	23.1	1.75	30	9 27	4 2 58.53	+19 55 21.7	2.1	22.3	1.68
16	12 43	4 25 43.74	+20 45 37.7	2.2	23.1	1.75	31	9 23	4 2 37.17	+19 54 35.9	2.1	22.2	1.68

Stellar magnitude at opposition in November, 1917, -2.4.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S.T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
Jan. 0	13 21 8	2 29.61	+20 38 45.0	1.1	9.5	0.74	Feb. 15	10 6	7 47 37.99	+21 24 12.4	1.1	9.4	0.74
1	13 17 8	2 10.59	20 39 47.1	1.1	9.5	0.74	16	10 1	7 47 22.29	21 24 58.0	1.1	9.4	0.74
2	13 13 8	1 51.40	20 40 49.7	1.1	9.5	0.75	17	9 57	7 47 6.92	21 25 42.7	1.1	9.4	0.74
3	13 8 8	1 32.03	20 41 52.5	1.1	9.6	0.75	18	9 53	7 46 51.87	21 26 26.3	1.1	9.4	0.74
4	13 4 8	1 12.51	20 42 55.6	1.1	9.6	0.75	19	9 49	7 46 37.15	21 27 9.0	1.1	9.4	0.74
5	13 0 8	0 52.83	+20 43 59.1	1.1	9.6	0.75	20	9 45	7 46 22.79	+21 27 50.6	1.1	9.4	0.74
6	12 56 8	0 33.01	20 45 2.7	1.1	9.6	0.75	21	9 40	7 46 8.77	21 28 31.2	1.1	9.4	0.74
7	12 51 8	0 13.05	20 46 6.6	1.1	9.6	0.75	22	9 36	7 45 55.11	21 29 10.9	1.1	9.4	0.73
8	12 47 7	59 52.98	20 47 10.5	1.1	9.6	0.75	23	9 32	7 45 41.83	21 29 49.5	1.1	9.3	0.73
9	12 43 7	59 32.81	20 48 14.6	1.1	9.6	0.75	24	9 28	7 45 28.92	21 30 27.0	1.1	9.3	0.73
10	12 39 7	59 12.54	+20 49 18.8	1.1	9.6	0.75	25	9 24	7 45 16.39	+21 31 3.5	1.1	9.3	0.73
11	12 34 7	58 52.19	20 50 23.2	1.1	9.6	0.75	26	9 20	7 45 4.25	21 31 39.0	1.1	9.3	0.73
12	12 30 7	58 31.75	20 51 27.5	1.1	9.6	0.75	27	9 16	7 44 52.51	21 32 13.2	1.1	9.3	0.73
13	12 26 7	58 11.26	20 52 31.8	1.1	9.6	0.75	28	9 11	7 44 41.16	21 32 46.4	1.1	9.3	0.73
14	12 21 7	57 50.72	20 53 35.9	1.1	9.6	0.75	Mar. 1	9 7	7 44 30.22	21 33 18.5	1.1	9.3	0.73
15	12 17 7	57 30.13	+20 54 40.1	1.1	9.6	0.75	2	9 3	7 44 19.68	+21 33 49.4	1.1	9.2	0.73
16	12 13 7	57 9.53	20 55 44.2	1.1	9.6	0.75	3	8 59	7 44 9.57	21 34 19.3	1.1	9.2	0.73
17	12 9 7	56 48.91	20 56 48.1	1.1	9.6	0.75	4	8 55	7 43 59.87	21 34 48.0	1.0	9.2	0.73
18	12 4 7	56 28.28	20 57 51.7	1.1	9.6	0.75	5	8 51	7 43 50.59	21 35 15.7	1.0	9.2	0.72
19	12 0 7	56 7.66	20 58 55.2	1.1	9.6	0.75	6	8 47	7 43 41.74	21 35 42.3	1.0	9.2	0.72
20	11 56 7	55 47.06	+20 59 58.4	1.1	9.6	0.75	7	8 43	7 43 33.34	+21 36 7.7	1.0	9.2	0.72
21	11 52 7	55 26.50	21 1 1.3	1.1	9.6	0.75	8	8 39	7 43 25.35	21 36 32.0	1.0	9.2	0.72
22	11 47 7	55 5.99	21 2 4.0	1.1	9.6	0.75	9	8 35	7 43 17.80	21 36 55.1	1.0	9.2	0.72
23	11 43 7	54 45.54	21 3 6.3	1.1	9.6	0.75	10	8 31	7 43 10.69	21 37 17.2	1.0	9.1	0.72
24	11 39 7	54 25.15	21 4 8.1	1.1	9.6	0.75	11	8 27	7 43 4.03	21 37 38.1	1.0	9.1	0.72
25	11 34 7	54 4.85	+21 5 9.5	1.1	9.6	0.75	12	8 23	7 42 57.81	+21 37 57.8	1.0	9.1	0.72
26	11 30 7	53 44.65	21 6 10.5	1.1	9.6	0.75	13	8 18	7 42 52.04	21 38 16.5	1.0	9.1	0.71
27	11 26 7	53 24.56	21 7 11.0	1.1	9.6	0.75	14	8 14	7 42 46.72	21 38 33.9	1.0	9.1	0.71
28	11 22 7	53 4.60	21 8 10.9	1.1	9.6	0.75	15	8 10	7 42 41.86	21 38 50.2	1.0	9.1	0.71
29	11 17 7	52 44.76	21 9 10.3	1.1	9.6	0.75	16	8 6	7 42 37.46	21 39 5.3	1.0	9.0	0.71
30	11 13 7	52 25.07	+21 10 9.1	1.1	9.6	0.75	17	8 2	7 42 33.50	+21 39 19.4	1.0	9.0	0.71
31	11 9 7	52 5.52	21 11 7.3	1.1	9.6	0.75	18	7 58	7 42 30.01	21 39 32.1	1.0	9.0	0.71
Feb. 1	11 5 7	51 46.16	21 12 4.9	1.1	9.6	0.75	19	7 54	7 42 26.99	21 39 43.8	1.0	9.0	0.71
2	11 0 7	51 26.96	21 13 1.7	1.1	9.6	0.75	20	7 51	7 42 24.43	21 39 54.4	1.0	9.0	0.71
3	10 56 7	51 7.95	21 13 58.0	1.1	9.5	0.75	21	7 47	7 42 22.34	21 40 3.7	1.0	9.0	0.71
4	10 52 7	50 49.14	+21 14 53.5	1.1	9.5	0.75	22	7 43	7 42 20.71	+21 40 11.8	1.0	9.0	0.70
5	10 48 7	50 30.53	21 15 48.4	1.1	9.5	0.75	23	7 39	7 42 19.56	21 40 18.8	1.0	8.9	0.70
6	10 43 7	50 12.14	21 16 42.5	1.1	9.5	0.75	24	7 35	7 42 18.88	21 40 24.6	1.0	8.9	0.70
7	10 39 7	49 53.98	21 17 35.7	1.1	9.5	0.74	25	7 31	7 42 18.67	21 40 29.2	1.0	8.9	0.70
8	10 35 7	49 36.05	21 18 28.3	1.1	9.5	0.74	26	7 27	7 42 18.93	21 40 32.6	1.0	8.9	0.70
9	10 31 7	49 18.38	+21 19 20.0	1.1	9.5	0.74	27	7 23	7 42 19.66	+21 40 34.9	1.0	8.9	0.70
10	10 27 7	49 0.95	21 20 10.8	1.1	9.5	0.74	28	7 19	7 42 20.86	21 40 36.0	1.0	8.9	0.70
11	10 22 7	48 43.80	21 21 0.9	1.1	9.5	0.74	29	7 15	7 42 22.53	21 40 36.0	1.0	8.8	0.69
12	10 18 7	48 26.91	21 21 50.1	1.1	9.5	0.74	30	7 11	7 42 24.66	21 40 34.7	1.0	8.8	0.69
13	10 14 7	48 10.31	21 22 38.5	1.1	9.5	0.74	31	7 7	7 42 27.26	21 40 32.4	1.0	8.8	0.69
14	10 10 7	47 54.00	+21 23 25.9	1.1	9.5	0.74	Apr. 1	7 3	7 42 30.33	+21 40 28.8	1.0	8.8	0.69
15	10 6 7	47 37.99	+21 24 12.4	1.1	9.4	0.74	2	7 0	7 42 33.85	+21 40 24.1	1.0	8.8	0.69

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	7 3	7 42 30.33	+21 40 28.8	1.0	8.8	0.69	Nov. 15	17 29	9 8 30.07	+17 8 50.3	1.0	8.7	0.67
2	7 0	7 42 33.85	21 40 24.1	1.0	8.8	0.69	16	17 25	9 8 34.42	17 8 41.9	1.0	8.7	0.67
3	6 56	7 42 37.84	21 40 18.2	1.0	8.8	0.69	17	17 21	9 8 38.34	17 8 35.4	1.0	8.7	0.67
4	6 52	7 42 42.29	21 40 11.2	1.0	8.8	0.69	18	17 17	9 8 41.80	17 8 30.8	1.0	8.7	0.67
5	6 48	7 42 47.19	21 40 3.1	1.0	8.7	0.68	19	17 13	9 8 44.83	17 8 28.2	1.0	8.8	0.67
6	6 44	7 42 52.55	+21 39 53.8	1.0	8.7	0.68	20	17 9	9 8 47.40	+17 8 27.6	1.0	8.8	0.67
7	6 40	7 42 58.36	21 39 43.4	1.0	8.7	0.68	21	17 5	9 8 49.53	17 8 29.1	1.0	8.8	0.67
8	6 37	7 43 4.63	21 39 31.7	1.0	8.7	0.68	22	17 2	9 8 51.21	17 8 32.4	1.0	8.8	0.67
9	6 33	7 43 11.34	21 39 19.0	1.0	8.7	0.68	23	16 58	9 8 52.45	17 8 37.8	1.0	8.8	0.67
10	6 29	7 43 18.50	21 39 5.2	1.0	8.6	0.68	24	16 54	9 8 53.23	17 8 45.1	1.0	8.8	0.68
11	6 25	7 43 26.10	+21 38 50.2	1.0	8.6	0.68	25	16 50	9 8 53.57	+17 8 54.4	1.0	8.9	0.68
12	6 21	7 43 34.16	21 38 34.2	1.0	8.6	0.68	26	16 46	9 8 53.45	17 9 5.6	1.0	8.9	0.68
13	6 17	7 43 42.64	21 38 17.0	1.0	8.6	0.68	27	16 42	9 8 52.89	17 9 18.8	1.0	8.9	0.68
14	6 14	7 43 51.57	21 37 58.8	1.0	8.6	0.67	28	16 38	9 8 51.89	17 9 33.9	1.0	8.9	0.68
15	6 10	7 44 0.94	21 37 39.4	1.0	8.6	0.67	29	16 34	9 8 50.44	17 9 51.0	1.0	8.9	0.68
16	6 6	7 44 10.75	+21 37 18.8	1.0	8.6	0.67	30	16 30	9 8 48.55	+17 10 10.0	1.0	8.9	0.68
17	6 2	7 44 20.98	21 36 57.1	1.0	8.5	0.67	Dec. 1	16 26	9 8 46.20	17 10 31.0	1.0	8.9	0.68
18	5 59	7 44 31.64	21 36 34.2	1.0	8.5	0.67	2	16 22	9 8 43.42	17 10 53.9	1.0	9.0	0.68
19	5 55	7 44 42.73	21 36 10.3	1.0	8.5	0.67	3	16 18	9 8 40.18	17 11 18.8	1.0	9.0	0.69
20	5 51	7 44 54.25	21 35 45.2	1.0	8.5	0.67	4	16 14	9 8 36.51	17 11 45.6	1.0	9.0	0.69
Oct. 20	19 7 9	4 7.28	+17 23 24.1	0.9	8.3	0.64	5	16 10	9 8 32.39	+17 12 14.3	1.0	9.0	0.69
21	19 3 9	4 22.40	17 22 28.9	0.9	8.3	0.64	6	16 6	9 8 27.84	17 12 44.9	1.0	9.0	0.69
22	18 59	9 4 37.14	17 21 35.4	0.9	8.3	0.64	7	16 2	9 8 22.84	17 13 17.4	1.0	9.0	0.69
23	18 56	9 4 51.51	17 20 43.3	0.9	8.3	0.64	8	15 58	9 8 17.41	17 13 51.8	1.0	9.1	0.69
24	18 52	9 5 5.49	17 19 53.0	0.9	8.4	0.64	9	15 54	9 8 11.55	17 14 28.1	1.0	9.1	0.69
25	18 48	9 5 19.09	+17 19 4.3	1.0	8.4	0.64	10	15 50	9 8 5.25	+17 15 6.3	1.0	9.1	0.70
26	18 45	9 5 32.30	17 18 17.3	1.0	8.4	0.64	11	15 46	9 7 58.53	17 15 46.3	1.0	9.1	0.70
27	18 41	9 5 45.11	17 17 31.8	1.0	8.4	0.64	12	15 42	9 7 51.37	17 16 28.1	1.0	9.1	0.70
28	18 37	9 5 57.52	17 16 48.1	1.0	8.4	0.64	13	15 38	9 7 43.80	17 17 11.8	1.0	9.1	0.70
29	18 33	9 6 9.54	17 16 6.2	1.0	8.4	0.64	14	15 34	9 7 35.81	17 17 57.1	1.0	9.1	0.70
30	18 30	9 6 21.15	+17 15 25.9	1.0	8.4	0.65	15	15 30	9 7 27.40	+17 18 44.2	1.0	9.2	0.70
31	18 26	9 6 32.37	17 14 47.4	1.0	8.5	0.65	16	15 26	9 7 18.58	17 19 33.1	1.0	9.2	0.70
Nov. 1	18 22	9 6 43.18	17 14 10.6	1.0	8.5	0.65	17	15 22	9 7 9.35	17 20 23.5	1.0	9.2	0.70
2	18 18	9 6 53.58	17 13 35.7	1.0	8.5	0.65	18	15 18	9 6 59.73	17 21 15.7	1.0	9.2	0.70
3	18 15	9 7 3.56	17 13 2.4	1.0	8.5	0.65	19	15 13	9 6 49.70	17 22 9.4	1.0	9.2	0.70
4	18 11	9 7 13.13	+17 12 31.1	1.0	8.5	0.65	20	15 9	9 6 39.29	+17 23 4.9	1.0	9.2	0.71
5	18 7	9 7 22.28	17 12 1.5	1.0	8.5	0.65	21	15 5	9 6 28.49	17 24 1.9	1.0	9.2	0.71
6	18 3	9 7 31.00	17 11 33.8	1.0	8.6	0.65	22	15 1	9 6 17.32	17 25 0.4	1.0	9.2	0.71
7	17 59	9 7 39.30	17 11 8.0	1.0	8.6	0.66	23	14 57	9 6 5.77	17 26 0.5	1.1	9.3	0.71
8	17 56	9 7 47.17	17 10 44.1	1.0	8.6	0.66	24	14 53	9 5 53.86	17 27 2.0	1.1	9.3	0.71
9	17 52	9 7 54.61	+17 10 22.0	1.0	8.6	0.66	25	14 49	9 5 41.59	+17 28 4.9	1.1	9.3	0.71
10	17 48	9 8 1.61	17 10 1.9	1.0	8.6	0.66	26	14 45	9 5 28.97	17 29 9.3	1.1	9.3	0.71
11	17 44	9 8 8.18	17 9 43.7	1.0	8.6	0.66	27	14 40	9 5 15.99	17 30 15.0	1.1	9.3	0.71
12	17 40	9 8 14.32	17 9 27.5	1.0	8.6	0.66	28	14 36	9 5 2.68	17 31 22.0	1.1	9.3	0.71
13	17 36	9 8 20.01	17 9 13.1	1.0	8.7	0.66	29	14 32	9 4 49.02	17 32 30.5	1.1	9.3	0.71
14	17 33	9 8 25.27	+17 9 0.7	1.0	8.7	0.66	30	14 28	9 4 35.05	+17 33 40.1	1.1	9.3	0.72
15	17 29	9 8 30.07	+17 8 50.3	1.0	8.7	0.67	31	14 24	9 4 20.74	+17 34 51.0	1.1	9.4	0.72

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Past. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Past. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
June 6	16 44	21 45 1.52	-14 19 8.6	0.4	1.7	0.12	July 22	13 39	21 40 54.36	-14 41 26.5	0.5	1.8	0.12
7	16 40	21 44 59.76	14 19 20.0	0.4	1.7	0.12	23	13 35	21 40 46.00	14 42 9.6	0.5	1.8	0.12
8	16 36	21 44 57.82	14 19 32.3	0.5	1.7	0.12	24	13 31	21 40 37.57	14 42 53.0	0.5	1.8	0.12
9	16 32	21 44 55.69	14 19 45.5	0.5	1.7	0.12	25	13 27	21 40 29.04	14 43 36.8	0.5	1.8	0.12
10	16 28	21 44 53.38	14 19 59.6	0.5	1.7	0.12	26	13 23	21 40 20.45	14 44 21.0	0.5	1.8	0.12
11	16 24	21 44 50.89	-14 20 14.6	0.5	1.7	0.12	27	13 19	21 40 11.78	-14 45 5.3	0.5	1.8	0.12
12	16 20	21 44 48.23	14 20 30.5	0.5	1.7	0.12	28	13 15	21 40 3.04	14 45 50.0	0.5	1.8	0.12
13	16 16	21 44 45.39	14 20 47.3	0.5	1.7	0.12	29	13 10	21 39 54.24	14 46 34.9	0.5	1.8	0.12
14	16 12	21 44 42.36	14 21 5.0	0.5	1.7	0.12	30	13 6	21 39 45.39	14 47 20.2	0.5	1.8	0.12
15	16 8	21 44 39.16	14 21 23.6	0.5	1.7	0.12	31	13 2	21 39 36.48	14 48 5.5	0.5	1.8	0.12
16	16 4	21 44 35.79	-14 21 43.1	0.5	1.7	0.12	Aug. 1	12 58	21 39 27.51	-14 48 51.1	0.5	1.8	0.12
17	16 0	21 44 32.24	14 22 3.4	0.5	1.7	0.12	2	12 54	21 39 18.48	14 49 36.8	0.5	1.8	0.12
18	15 56	21 44 28.52	14 22 24.5	0.5	1.7	0.12	3	12 50	21 39 9.42	14 50 22.6	0.5	1.8	0.12
19	15 52	21 44 24.63	14 22 46.5	0.5	1.7	0.12	4	12 46	21 39 0.31	14 51 8.8	0.5	1.8	0.12
20	15 48	21 44 20.57	14 23 9.3	0.5	1.7	0.12	5	12 42	21 38 51.16	14 51 55.0	0.5	1.8	0.12
21	15 44	21 44 16.34	-14 23 33.0	0.5	1.7	0.12	6	12 38	21 38 41.97	-14 52 41.3	0.5	1.8	0.12
22	15 40	21 44 11.95	14 23 57.5	0.5	1.7	0.12	7	12 34	21 38 32.75	14 53 27.7	0.5	1.8	0.12
23	15 36	21 44 7.40	14 24 22.8	0.5	1.7	0.12	8	12 30	21 38 23.50	14 54 14.3	0.5	1.8	0.12
24	15 32	21 44 2.69	14 24 48.9	0.5	1.7	0.12	9	12 26	21 38 14.22	14 55 0.8	0.5	1.8	0.12
25	15 28	21 43 57.81	14 25 15.7	0.5	1.7	0.12	10	12 22	21 38 4.93	14 55 47.4	0.5	1.8	0.12
26	15 24	21 43 52.78	-14 25 43.3	0.5	1.7	0.12	11	12 18	21 37 55.61	-14 56 34.0	0.5	1.8	0.12
27	15 20	21 43 47.59	14 26 11.7	0.5	1.7	0.12	12	12 13	21 37 46.28	14 57 20.6	0.5	1.8	0.12
28	15 16	21 43 42.25	14 26 40.8	0.5	1.7	0.12	13	12 9	21 37 36.95	14 58 7.1	0.5	1.8	0.12
29	15 12	21 43 36.76	14 27 10.6	0.5	1.7	0.12	14	12 5	21 37 27.60	14 58 53.7	0.5	1.8	0.12
30	15 8	21 43 31.12	14 27 41.1	0.5	1.7	0.12	15	12 1	21 37 18.25	14 59 40.1	0.5	1.8	0.12
July 1	15 4	21 43 25.34	-14 28 12.3	0.5	1.7	0.12	16	11 57	21 37 8.89	-15 0 26.5	0.5	1.8	0.12
2	15 0	21 43 19.41	14 28 44.2	0.5	1.7	0.12	17	11 53	21 36 59.55	15 1 12.8	0.5	1.8	0.12
3	14 56	21 43 13.34	14 29 16.8	0.5	1.7	0.12	18	11 49	21 36 50.21	15 1 59.0	0.5	1.8	0.12
4	14 52	21 43 7.14	14 29 50.1	0.5	1.7	0.12	19	11 45	21 36 40.90	15 2 45.0	0.5	1.8	0.12
5	14 48	21 43 0.79	14 30 24.0	0.5	1.7	0.12	20	11 41	21 36 31.59	15 3 30.9	0.5	1.8	0.12
6	14 44	21 42 54.30	-14 30 58.5	0.5	1.7	0.12	21	11 37	21 36 22.31	-15 4 16.7	0.5	1.8	0.12
7	14 40	21 42 47.69	14 31 33.7	0.5	1.7	0.12	22	11 32	21 36 13.05	15 5 2.1	0.5	1.8	0.12
8	14 36	21 42 40.95	14 32 9.5	0.5	1.7	0.12	23	11 28	21 36 3.83	15 5 47.4	0.5	1.8	0.12
9	14 32	21 42 34.08	14 32 45.9	0.5	1.8	0.12	24	11 24	21 35 54.64	15 6 32.4	0.5	1.8	0.12
10	14 28	21 42 27.08	14 33 22.9	0.5	1.8	0.12	25	11 20	21 35 45.47	15 7 17.2	0.5	1.8	0.12
11	14 24	21 42 19.96	-14 34 0.4	0.5	1.8	0.12	26	11 16	21 35 36.36	-15 8 1.7	0.5	1.8	0.12
12	14 20	21 42 12.72	14 34 38.5	0.5	1.8	0.12	27	11 12	21 35 27.29	15 8 45.9	0.5	1.8	0.12
13	14 16	21 42 5.37	14 35 17.1	0.5	1.8	0.12	28	11 8	21 35 18.27	15 9 29.9	0.5	1.8	0.12
14	14 12	21 41 57.89	14 35 56.3	0.5	1.8	0.12	29	11 4	21 35 9.31	15 10 13.4	0.5	1.8	0.12
15	14 8	21 41 50.31	14 36 35.9	0.5	1.8	0.12	30	11 0	21 35 0.40	15 10 56.6	0.5	1.8	0.12
16	14 4	21 41 42.61	-14 37 16.1	0.5	1.8	0.12	31	10 56	21 34 51.54	-15 11 39.6	0.5	1.8	0.12
17	13 59	21 41 34.82	14 37 56.8	0.5	1.8	0.12	Sept. 1	10 52	21 34 42.75	15 12 22.1	0.5	1.8	0.12
18	13 55	21 41 26.92	14 38 37.9	0.5	1.8	0.12	2	10 48	21 34 34.03	15 13 4.2	0.5	1.8	0.12
19	13 51	21 41 18.92	14 39 19.4	0.5	1.8	0.12	3	10 44	21 34 25.37	15 13 45.8	0.5	1.8	0.12
20	13 47	21 41 10.83	14 40 1.4	0.5	1.8	0.12	4	10 40	21 34 16.79	15 14 27.1	0.5	1.8	0.12
21	13 43	21 41 2.64	-14 40 43.8	0.5	1.8	0.12	5	10 35	21 34 8.29	-15 15 8.0	0.5	1.8	0.12
22	13 39	21 40 54.36	-14 41 26.5	0.5	1.8	0.12	6	10 31	21 33 59.86	-15 15 48.4	0.5	1.8	0.12

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	" "	" "	" s		h m	h m s	" "	" "	" s
Sept. 6	10 31	21 33 59.86	-15 15 48.4	0.5	1.8 0.12	Oct. 22	7 26	21 29 52.65	-15 34 34.5	0.4	1.7 0.12
7	10 27	21 33 51.52	15 16 28.4	0.5	1.8 0.12	23	7 22	21 29 51.25	15 34 39.2	0.4	1.7 0.12
8	10 23	21 33 43.26	15 17 7.9	0.5	1.8 0.12	24	7 18	21 29 50.04	15 34 42.9	0.4	1.7 0.12
9	10 19	21 33 35.09	15 17 46.8	0.5	1.8 0.12	25	7 14	21 29 49.02	15 34 45.6	0.4	1.7 0.12
10	10 15	21 33 27.02	15 18 25.2	0.5	1.8 0.12	26	7 11	21 29 48.19	15 34 47.4	0.4	1.7 0.12
11	10 11	21 33 19.04	-15 19 3.1	0.5	1.8 0.12	27	7 7	21 29 47.56	-15 34 48.3	0.4	1.7 0.12
12	10 7	21 33 11.17	15 19 40.4	0.5	1.8 0.12	28	7 3	21 29 47.13	15 34 48.2	0.4	1.7 0.12
13	10 3	21 33 3.41	15 20 17.1	0.5	1.8 0.12	29	6 59	21 29 46.90	15 34 47.2	0.4	1.7 0.12
14	9 59	21 32 55.75	15 20 53.3	0.5	1.8 0.12	30	6 55	21 29 46.87	15 34 45.2	0.4	1.7 0.12
15	9 55	21 32 48.21	15 21 28.9	0.5	1.8 0.12	31	6 51	21 29 47.03	15 34 42.2	0.4	1.7 0.12
16	9 51	21 32 40.77	-15 22 3.8	0.5	1.8 0.12	Nov. 1	6 47	21 29 47.41	-15 34 38.3	0.4	1.7 0.12
17	9 47	21 32 33.45	15 22 38.1	0.5	1.8 0.12	2	6 43	21 29 47.97	15 34 33.4	0.4	1.7 0.12
18	9 43	21 32 26.26	15 23 11.8	0.5	1.8 0.12	3	6 39	21 29 48.73	15 34 27.6	0.4	1.7 0.12
19	9 39	21 32 19.20	15 23 44.8	0.5	1.7 0.12	4	6 35	21 29 49.70	15 34 20.8	0.4	1.7 0.12
20	9 35	21 32 12.26	15 24 17.2	0.5	1.7 0.12	5	6 31	21 29 50.86	15 34 13.1	0.4	1.7 0.12
21	9 30	21 32 5.46	-15 24 48.8	0.5	1.7 0.12	6	6 27	21 29 52.23	-15 34 4.3	0.4	1.7 0.12
22	9 26	21 31 58.78	15 25 19.8	0.5	1.7 0.12	7	6 24	21 29 53.79	15 33 54.6	0.4	1.7 0.12
23	9 22	21 31 52.25	15 25 50.0	0.5	1.7 0.12	8	6 20	21 29 55.55	15 33 43.9	0.4	1.7 0.12
24	9 18	21 31 45.85	15 26 19.5	0.5	1.7 0.12	9	6 16	21 29 57.52	15 33 32.3	0.4	1.7 0.12
25	9 14	21 31 39.60	15 26 48.3	0.5	1.7 0.12	10	6 12	21 29 59.68	15 33 19.7	0.4	1.7 0.12
26	9 10	21 31 33.49	-15 27 16.4	0.5	1.7 0.12	11	6 8	21 30 2.05	-15 33 6.1	0.4	1.7 0.12
27	9 6	21 31 27.53	15 27 43.7	0.5	1.7 0.12	12	6 4	21 30 4.62	15 32 51.6	0.4	1.7 0.12
28	9 2	21 31 21.71	15 28 10.2	0.5	1.7 0.12	13	6 0	21 30 7.39	15 32 36.1	0.4	1.7 0.12
29	8 58	21 31 16.05	15 28 36.0	0.5	1.7 0.12	14	5 56	21 30 10.35	15 32 19.6	0.4	1.7 0.12
30	8 54	21 31 10.55	15 29 1.0	0.5	1.7 0.12	15	5 52	21 30 13.52	15 32 2.2	0.4	1.7 0.12
Oct. 1	8 50	21 31 5.19	-15 29 25.1	0.5	1.7 0.12	16	5 48	21 30 16.89	-15 31 43.8	0.4	1.7 0.12
2	8 46	21 31 0.00	15 29 48.4	0.5	1.7 0.12	17	5 45	21 30 20.45	15 31 24.5	0.4	1.7 0.12
3	8 42	21 30 54.98	15 30 11.1	0.5	1.7 0.12	18	5 41	21 30 24.21	15 31 4.2	0.4	1.7 0.12
4	8 38	21 30 50.11	15 30 32.9	0.5	1.7 0.12	19	5 37	21 30 28.17	15 30 43.0	0.4	1.7 0.12
5	8 34	21 30 45.41	15 30 53.8	0.5	1.7 0.12	20	5 33	21 30 32.32	15 30 20.8	0.4	1.7 0.12
6	8 30	21 30 40.86	-15 31 13.8	0.5	1.7 0.12	21	5 29	21 30 36.68	-15 29 57.7	0.4	1.7 0.12
7	8 26	21 30 36.50	15 31 33.0	0.5	1.7 0.12	22	5 25	21 30 41.23	15 29 33.7	0.4	1.7 0.12
8	8 22	21 30 32.31	15 31 51.5	0.5	1.7 0.12	23	5 22	21 30 45.96	15 29 8.8	0.4	1.7 0.12
9	8 18	21 30 28.28	15 32 9.0	0.5	1.7 0.12	24	5 18	21 30 50.88	15 28 43.0	0.4	1.7 0.11
10	8 14	21 30 24.43	15 32 25.6	0.5	1.7 0.12	25	5 14	21 30 55.99	15 28 16.2	0.4	1.7 0.11
11	8 10	21 30 20.76	-15 32 41.4	0.5	1.7 0.12	26	5 10	21 31 1.29	-15 27 48.6	0.4	1.7 0.11
12	8 6	21 30 17.28	15 32 56.3	0.5	1.7 0.12	27	5 6	21 31 6.77	15 27 20.1	0.4	1.7 0.11
13	8 2	21 30 13.98	15 33 10.3	0.5	1.7 0.12	28	5 2	21 31 12.44	15 26 50.6	0.4	1.7 0.11
14	7 58	21 30 10.86	15 33 23.3	0.5	1.7 0.12	29	4 58	21 31 18.29	15 26 20.2	0.4	1.7 0.11
15	7 54	21 30 7.92	15 33 35.5	0.5	1.7 0.12	30	4 55	21 31 24.33	15 25 49.0	0.4	1.7 0.11
16	7 50	21 30 5.17	-15 33 46.7	0.5	1.7 0.12	Dec. 1	4 51	21 31 30.55	-15 25 17.0	0.4	1.7 0.11
17	7 46	21 30 2.61	15 33 57.0	0.5	1.7 0.12	2	4 47	21 31 36.94	15 24 44.1	0.4	1.7 0.11
18	7 42	21 30 0.23	15 34 6.4	0.5	1.7 0.12	3	4 43	21 31 43.52	15 24 10.3	0.4	1.7 0.11
19	7 38	21 29 58.05	15 34 14.8	0.5	1.7 0.12	4	4 39	21 31 50.28	15 23 35.6	0.4	1.6 0.11
20	7 34	21 29 56.06	15 34 22.3	0.4	1.7 0.12	5	4 36	21 31 57.21	15 23 0.1	0.4	1.6 0.11
21	7 30	21 29 54.26	-15 34 28.9	0.4	1.7 0.12	6	4 32	21 32 4.32	-15 22 23.7	0.4	1.6 0.11
22	7 26	21 29 52.65	-15 34 34.5	0.4	1.7 0.12	7	4 28	21 32 11.59	-15 21 46.5	0.4	1.6 0.11

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
Jan. 0	13 44	8 25 33.79	+19 0 9.6	0.3	1.3	0.09	Feb. 15	10 38	8 20 25.84	+19 18 5.2	0.3	1.3	0.09
1	13 40	8 25 27.56	19 0 31.5	0.3	1.3	0.09	16	10 34	8 20 19.64	19 18 26.8	0.3	1.3	0.09
2	13 36	8 25 21.27	19 0 53.7	0.3	1.3	0.09	17	10 30	8 20 13.51	19 18 48.1	0.3	1.3	0.09
3	13 32	8 25 14.94	19 1 16.0	0.3	1.3	0.09	18	10 26	8 20 7.46	19 19 9.2	0.3	1.3	0.09
4	13 28	8 25 8.54	19 1 38.5	0.3	1.3	0.09	19	10 22	8 20 1.46	19 19 30.0	0.3	1.3	0.09
5	13 24	8 25 2.09	+19 2 1.3	0.3	1.3	0.09	20	10 18	8 19 55.54	+19 19 50.6	0.3	1.3	0.09
6	13 20	8 24 55.59	19 2 24.1	0.3	1.3	0.09	21	10 14	8 19 49.70	19 20 10.9	0.3	1.3	0.09
7	13 16	8 24 49.04	19 2 47.1	0.3	1.3	0.09	22	10 10	8 19 43.92	19 20 31.1	0.3	1.3	0.09
8	13 12	8 24 42.44	19 3 10.3	0.3	1.3	0.09	23	10 6	8 19 38.23	19 20 50.8	0.3	1.3	0.09
9	13 8	8 24 35.81	19 3 33.6	0.3	1.3	0.09	24	10 2	8 19 32.63	19 21 10.4	0.3	1.3	0.09
10	13 4	8 24 29.14	+19 3 57.0	0.3	1.3	0.09	25	9 58	8 19 27.10	+19 21 29.6	0.3	1.3	0.09
11	13 0	8 24 22.42	19 4 20.5	0.3	1.3	0.09	26	9 54	8 19 21.66	19 21 48.6	0.3	1.3	0.09
12	12 56	8 24 15.67	19 4 44.2	0.3	1.3	0.09	27	9 50	8 19 16.31	19 22 7.3	0.3	1.3	0.09
13	12 52	8 24 8.90	19 5 7.9	0.3	1.3	0.09	28	9 46	8 19 11.05	19 22 25.6	0.3	1.3	0.09
14	12 48	8 24 2.09	19 5 31.7	0.3	1.3	0.09	Mar. 1	9 42	8 19 5.88	19 22 43.6	0.3	1.3	0.09
15	12 43	8 23 55.26	+19 5 55.7	0.3	1.3	0.09	2	9 38	8 19 0.80	+19 23 1.4	0.3	1.3	0.09
16	12 39	8 23 48.39	19 6 19.7	0.3	1.3	0.09	3	9 34	8 18 55.82	19 23 18.8	0.3	1.3	0.09
17	12 35	8 23 41.51	19 6 43.9	0.3	1.3	0.09	4	9 30	8 18 50.93	19 23 35.9	0.3	1.3	0.09
18	12 31	8 23 34.60	19 7 8.0	0.3	1.3	0.09	5	9 26	8 18 46.15	19 23 52.7	0.3	1.3	0.09
19	12 27	8 23 27.69	19 7 32.1	0.3	1.3	0.09	6	9 22	8 18 41.47	19 24 9.1	0.3	1.3	0.09
20	12 23	8 23 20.77	+19 7 56.3	0.3	1.3	0.09	7	9 18	8 18 36.89	+19 24 25.2	0.3	1.3	0.09
21	12 19	8 23 13.84	19 8 20.6	0.3	1.3	0.09	8	9 14	8 18 32.41	19 24 40.9	0.3	1.3	0.09
22	12 15	8 23 6.90	19 8 44.8	0.3	1.3	0.09	9	9 10	8 18 28.05	19 24 56.4	0.3	1.3	0.09
23	12 11	8 22 59.95	19 9 9.0	0.3	1.3	0.09	10	9 6	8 18 23.79	19 25 11.4	0.3	1.3	0.09
24	12 7	8 22 53.01	19 9 33.3	0.3	1.3	0.09	11	9 2	8 18 19.63	19 25 26.0	0.3	1.3	0.09
25	12 3	8 22 46.07	+19 9 57.5	0.3	1.3	0.09	12	8 58	8 18 15.60	+19 25 40.3	0.3	1.3	0.09
26	11 59	8 22 39.13	19 10 21.7	0.3	1.3	0.09	13	8 54	8 18 11.67	19 25 54.3	0.3	1.3	0.09
27	11 55	8 22 32.19	19 10 45.9	0.3	1.3	0.09	14	8 50	8 18 7.85	19 26 7.9	0.3	1.3	0.09
28	11 51	8 22 25.27	19 11 10.0	0.3	1.3	0.09	15	8 46	8 18 4.15	19 26 21.1	0.3	1.3	0.09
29	11 47	8 22 18.37	19 11 34.1	0.3	1.3	0.09	16	8 42	8 18 0.56	19 26 33.9	0.3	1.3	0.09
30	11 43	8 22 11.49	+19 11 58.0	0.3	1.3	0.09	17	8 38	8 17 57.10	+19 26 46.3	0.3	1.3	0.09
31	11 39	8 22 4.62	19 12 21.9	0.3	1.3	0.09	18	8 34	8 17 53.76	19 26 58.4	0.3	1.3	0.09
Feb. 1	11 35	8 21 57.78	19 12 45.7	0.3	1.3	0.09	19	8 30	8 17 50.53	19 27 10.0	0.3	1.3	0.09
2	11 31	8 21 50.96	19 13 9.4	0.3	1.3	0.09	20	8 26	8 17 47.41	19 27 21.2	0.3	1.3	0.09
3	11 27	8 21 44.18	19 13 32.9	0.3	1.3	0.09	21	8 22	8 17 44.43	19 27 32.0	0.3	1.3	0.09
4	11 23	8 21 37.42	+19 13 56.5	0.3	1.3	0.09	22	8 18	8 17 41.58	+19 27 42.4	0.3	1.3	0.09
5	11 19	8 21 30.69	19 14 19.9	0.3	1.3	0.09	23	8 14	8 17 38.85	19 27 52.4	0.3	1.3	0.09
6	11 15	8 21 24.01	19 14 43.1	0.3	1.3	0.09	24	8 10	8 17 36.24	19 28 2.0	0.3	1.2	0.09
7	11 11	8 21 17.36	19 15 6.2	0.3	1.3	0.09	25	8 6	8 17 33.77	19 28 11.1	0.3	1.2	0.09
8	11 6	8 21 10.75	19 15 29.2	0.3	1.3	0.09	26	8 2	8 17 31.43	19 28 19.8	0.3	1.2	0.09
9	11 2	8 21 4.18	+19 15 52.1	0.3	1.3	0.09	27	7 58	8 17 29.22	+19 28 28.1	0.3	1.2	0.09
10	10 58	8 20 57.65	19 16 14.7	0.3	1.3	0.09	28	7 54	8 17 27.13	19 28 36.1	0.3	1.2	0.09
11	10 54	8 20 51.18	19 16 37.2	0.3	1.3	0.09	29	7 50	8 17 25.18	19 28 43.6	0.3	1.2	0.09
12	10 50	8 20 44.76	19 16 59.5	0.3	1.3	0.09	30	7 46	8 17 23.36	19 28 50.6	0.3	1.2	0.09
13	10 46	8 20 38.40	19 17 21.6	0.3	1.3	0.09	31	7 42	8 17 21.68	19 28 57.2	0.3	1.2	0.09
14	10 42	8 20 32.10	+19 17 43.6	0.3	1.3	0.09	Apr. 1	7 38	8 17 20.12	+19 29 3.4	0.3	1.2	0.09
15	10 38	8 20 25.84	+19 18 5.5	0.3	1.3	0.09	2	7 34	8 17 18.70	+19 29 9.1	0.3	1.2	0.09

Stellar magnitude at opposition in January, 1917, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	" ' "	"	"	s		h m	h m s	" ' "	"	"	s
Apr. 1	7 38	8 17 20.12	+19 29 3.4	0.3	1.2	0.09	Nov. 15	16 58	8 37 48.91	+18 20 12.7	0.3	1.2	0.09
2	7 34	8 17 18.70	19 29 9.1	0.3	1.2	0.09	16	16 54	8 37 47.95	18 20 16.6	0.3	1.2	0.09
3	7 30	8 17 17.41	19 29 14.4	0.3	1.2	0.09	17	16 50	8 37 46.85	18 20 21.0	0.3	1.2	0.09
4	7 26	8 17 16.25	19 29 19.3	0.3	1.2	0.09	18	16 46	8 37 45.62	18 20 25.9	0.3	1.2	0.09
5	7 22	8 17 15.23	19 29 23.7	0.3	1.2	0.09	19	16 42	8 37 44.25	18 20 31.3	0.3	1.2	0.09
6	7 18	8 17 14.35	+19 29 27.6	0.3	1.2	0.09	20	16 38	8 37 42.75	+18 20 37.2	0.3	1.2	0.09
7	7 14	8 17 13.61	19 29 31.2	0.3	1.2	0.09	21	16 34	8 37 41.11	18 20 43.6	0.3	1.2	0.09
8	7 10	8 17 13.00	19 29 34.3	0.3	1.2	0.09	22	16 30	8 37 39.34	18 20 50.6	0.3	1.2	0.09
9	7 7	8 17 12.52	19 29 37.0	0.3	1.2	0.09	23	16 27	8 37 37.44	18 20 58.0	0.3	1.2	0.09
10	7 3	8 17 12.18	19 29 39.2	0.3	1.2	0.09	24	16 23	8 37 35.41	18 21 5.9	0.3	1.2	0.09
11	6 59	8 17 11.98	+19 29 41.1	0.3	1.2	0.09	25	16 19	8 37 33.24	+18 21 14.3	0.3	1.2	0.09
12	6 55	8 17 11.92	19 29 42.5	0.3	1.2	0.09	26	16 15	8 37 30.94	18 21 23.2	0.3	1.2	0.09
13	6 51	8 17 11.99	19 29 43.3	0.3	1.2	0.09	27	16 11	8 37 28.52	18 21 32.6	0.3	1.2	0.09
14	6 47	8 17 12.20	19 29 43.7	0.3	1.2	0.09	28	16 7	8 37 25.97	18 21 42.5	0.3	1.2	0.09
15	6 43	8 17 12.54	19 29 43.7	0.3	1.2	0.09	29	16 3	8 37 23.29	18 21 52.7	0.3	1.2	0.09
16	6 39	8 17 13.03	+19 29 43.2	0.3	1.2	0.09	30	15 59	8 37 20.48	+18 22 3.5	0.3	1.3	0.09
17	6 35	8 17 13.64	19 29 42.3	0.3	1.2	0.09	Dec. 1	15 55	8 37 17.55	18 22 14.7	0.3	1.3	0.09
18	6 31	8 17 14.40	19 29 40.9	0.3	1.2	0.09	2	15 51	8 37 14.49	18 22 26.4	0.3	1.3	0.09
19	6 27	8 17 15.30	19 29 39.1	0.3	1.2	0.09	3	15 47	8 37 11.31	18 22 38.5	0.3	1.3	0.09
20	6 23	8 17 16.33	19 29 36.8	0.3	1.2	0.09	4	15 43	8 37 8.01	18 22 51.1	0.3	1.3	0.09
Oct. 20	18 40	8 37 25.29	+18 21 32.8	0.3	1.2	0.09	5	15 39	8 37 4.59	+18 23 4.2	0.3	1.3	0.09
21	18 36	8 37 27.91	18 21 23.5	0.3	1.2	0.09	6	15 35	8 37 1.05	18 23 17.7	0.3	1.3	0.09
22	18 32	8 37 30.39	18 21 14.5	0.3	1.2	0.09	7	15 31	8 36 57.39	18 23 31.6	0.3	1.3	0.09
23	18 28	8 37 32.74	18 21 6.1	0.3	1.2	0.09	8	15 27	8 36 53.61	18 23 46.0	0.3	1.3	0.09
24	18 24	8 37 34.95	18 20 58.1	0.3	1.2	0.09	9	15 23	8 36 49.72	18 24 0.8	0.3	1.3	0.09
25	18 20	8 37 37.03	+18 20 50.6	0.3	1.2	0.09	10	15 19	8 36 45.72	+18 24 16.0	0.3	1.3	0.09
26	18 17	8 37 38.98	18 20 43.7	0.3	1.2	0.09	11	15 15	8 36 41.60	18 24 31.6	0.3	1.3	0.09
27	18 13	8 37 40.79	18 20 37.3	0.3	1.2	0.09	12	15 11	8 36 37.37	18 24 47.6	0.3	1.3	0.09
28	18 9	8 37 42.46	18 20 31.4	0.3	1.2	0.09	13	15 7	8 36 33.03	18 25 4.1	0.3	1.3	0.09
29	18 5	8 37 43.99	18 20 26.0	0.3	1.2	0.09	14	15 3	8 36 28.59	18 25 20.9	0.3	1.3	0.09
30	18 1	8 37 45.39	+18 20 21.1	0.3	1.2	0.09	15	14 59	8 36 24.04	+18 25 38.2	0.3	1.3	0.09
31	17 57	8 37 46.65	18 20 16.7	0.3	1.2	0.09	16	14 55	8 36 19.38	18 25 55.8	0.3	1.3	0.09
Nov. 1	17 53	8 37 47.77	18 20 12.8	0.3	1.2	0.09	17	14 51	8 36 14.63	18 26 13.8	0.3	1.3	0.09
2	17 49	8 37 48.75	18 20 9.4	0.3	1.2	0.09	18	14 47	8 36 9.77	18 26 32.2	0.3	1.3	0.09
3	17 45	8 37 49.59	18 20 6.6	0.3	1.2	0.09	19	14 43	8 36 4.82	18 26 50.8	0.3	1.3	0.09
4	17 41	8 37 50.30	+18 20 4.2	0.3	1.2	0.09	20	14 39	8 36 59.77	+18 27 9.9	0.3	1.3	0.09
5	17 37	8 37 50.87	18 20 2.4	0.3	1.2	0.09	21	14 35	8 35 54.62	18 27 29.3	0.3	1.3	0.09
6	17 33	8 37 51.30	18 20 1.1	0.3	1.2	0.09	22	14 31	8 35 49.39	18 27 49.1	0.3	1.3	0.09
7	17 30	8 37 51.59	18 20 0.3	0.3	1.2	0.09	23	14 27	8 35 44.06	18 28 9.1	0.3	1.3	0.09
8	17 26	8 37 51.74	18 20 0.0	0.3	1.2	0.09	24	14 23	8 35 38.66	18 28 29.5	0.3	1.3	0.09
9	17 22	8 37 51.75	+18 20 0.3	0.3	1.2	0.09	25	14 19	8 35 33.17	+18 28 50.1	0.3	1.3	0.09
10	17 18	8 37 51.62	18 20 1.0	0.3	1.2	0.09	26	14 15	8 35 27.60	18 29 11.1	0.3	1.3	0.09
11	17 14	8 37 51.36	18 20 2.3	0.3	1.2	0.09	27	14 11	8 35 21.95	18 29 32.3	0.3	1.3	0.09
12	17 10	8 37 50.95	18 20 4.1	0.3	1.2	0.09	28	14 7	8 35 16.22	18 29 53.8	0.3	1.3	0.09
13	17 6	8 37 50.41	18 20 6.5	0.3	1.2	0.09	29	14 2	8 35 10.41	18 30 15.6	0.3	1.3	0.09
14	17 2	8 37 49.73	+18 20 9.3	0.3	1.2	0.09	30	13 58	8 35 4.54	+18 30 37.6	0.3	1.3	0.09
15	16 58	8 37 48.91	+18 20 12.7	0.3	1.2	0.09	31	13 54	8 34 58.58	+18 31 0.0	0.3	1.3	0.09

PART III.

PHENOMENA.

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In the year 1917 there will be seven eclipses, four of the Sun and three of the Moon.

I.—*A Total Eclipse of the Moon*, 1917, January 7, visible at Washington; the beginning visible generally in central and western Europe, northwestern Africa, North and South America, and the central and eastern portions of the Pacific Ocean; the ending visible generally in North America, northwestern South America, northern and northeastern Asia, and eastern Australia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, January 7 19 37 51.9				
	^h	^m	^s	
Sun's right ascension	19	15	47.52	Hourly motion 10.92
Moon's right ascension	7	15	47.52	Hourly motion 126.02
	.	'	"	'
Sun's declination	-22	18	27.7	Hourly motion + 0 19.7
Moon's declination	+22	31	53.8	Hourly motion - 6 34.0
Sun's equa. hor. parallax			8.9	Sun's true semidiameter 16 15.9
Moon's equa. hor. parallax	54	9.8		Moon's true semidiameter 14 44.8

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	
Moon enters penumbra	Jan.	7	16	35.7	} Greenwich Mean Time.
Moon enters shadow		7	17	50.4	
Total eclipse begins		7	19	0.4	
Middle of the eclipse		7	19	44.6	
Total eclipse ends		7	20	28.8	
Moon leaves shadow		7	21	38.6	
Moon leaves penumbra		7	22	52.7	
Contacts of Shadow with Moon's Limb.	Angles of Position from the North Point.	The Moon Being in the Zenith			
		in Longitude from Greenwich		and in Latitude	
		°		°	
First	117 to E.	+	86 48	+	22 43
Last	91 to W.	+	142 0	+	22 18

Magnitude of the eclipse=1.369 (Moon's diameter=1.0).

II.—*A Partial Eclipse of the Sun*, 1917, January 22, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, January 22 20 8 29.8				
	^h	^m	^s	
Sun and Moon's R. A	20	20	15.52	Hourly motions 10.51 and 152.97
	.	'	"	'
Sun's declination	-19	32	52.6	Hourly motion + 0 34.9
Moon's declination	-18	18	23.6	Hourly motion +12 3.2
Sun's equa. hor. parallax			8.9	Sun's true semidiameter 16 14.8
Moon's equa. hor. parallax	61	26.7		Moon's true semidiameter 16 43.7

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
Eclipse begins	Jan. 22 17 43.4	-18 2.1	+28 1.6
Greatest eclipse	22 19 28.3	-25 42.7	+63 15.2
Eclipse ends	22 21 13.0	-95 56.2	+60 28.0

Magnitude of greatest eclipse=0.725 (Sun's diameter=1.0).

III.—*A Partial Eclipse of the Sun*, 1917, June 18–19, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of \odot in right ascension, June 19							
	d	h	m	s			
Sun and Moon's R. A.		5	49	44.49	Hourly motions	10.40	and 137.78
		.	'	"			'
Sun's declination		+23	25	46.2	Hourly motion	+ 0	2.5
Moon's declination		+24	37	15.9	Hourly motion	- 2	15.1
Sun's equa. hor. parallax				8.7	Sun's true semidiameter	15	44.3
Moon's equa. hor. parallax		55	34.9		Moon's true semidiameter	15	8.0

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d h m	.	.
Eclipse begins	June 18 23 36.0	+118 43.2	+52 54.9
Greatest eclipse	19 1 16.2	-150 6.0	+66 10.5
Eclipse ends	19 2 56.5	- 72 35.0	+45 48.3

Magnitude of greatest eclipse=0.473 (Sun's diameter=1.0).

IV.—*A Total Eclipse of the Moon*, 1917, July 4, invisible at Washington; the beginning visible generally in Asia except the northeastern portion, Australia, Africa, Europe except the northwestern portions, and the south Atlantic Ocean; the ending visible generally in western Australia, southwestern Asia, Europe, Africa, and South America.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of \odot in right ascension, July 4							
	d	h	m	s			
Sun's right ascension		6	53	27.05	Hourly motion	10.30	
Moon's right ascension		18	53	27.05	Hourly motion	157.11	
		.	'	"			
Sun's declination		+22	52	53.9	Hourly motion	- 0	13.1
Moon's declination		-22	44	11.1	Hourly motion	+ 6	45.3
Sun's equa. hor. parallax				8.7	Sun's true semidiameter	15	43.9
Moon's equa. hor. parallax		60	17.1		Moon's true semidiameter	16	24.8

CIRCUMSTANCES OF THE ECLIPSE.

	July	d	h	m	} Greenwich Mean Time.
Moon enters penumbra	4	6	55.8		
Moon enters shadow	4	7	52.2		
Total eclipse begins	4	8	50.6		
Middle of the eclipse	4	9	38.9		
Total eclipse ends	4	10	27.2		
Moon leaves shadow	4	11	25.4		
Moon leaves penumbra	4	12	21.3		

Contacts of Shadow with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith	
		in Longitude from Greenwich	and in Latitude
		.	.
First	87 to E.	-61 52	-22 56
Last	109 to W.	-10 45	-22 32

Magnitude of the eclipse=1.625 (Moon's diameter=1.0).

V.—*A Partial Eclipse of the Sun*, 1917, July 18, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, July 18 15 34 16.6			
	d	h	m
			s
Sun and Moon's R. A.	7	51	28.79
	.	'	"
Sun's declination	+20	58	48.8
Moon's declination	+19	33	20.4
Sun's equa. hor. parallax			8.7
Moon's equa. hor. parallax	54	28.4	
Hourly motions	10.05	and	123.17
Hourly motion	—	0	26.6
Hourly motion	—	8	12.7
Sun's true semidiameter			15 44.3
Moon's true semidiameter			14 49.9

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d	h	m
			s
Eclipse begins	July 18	13 56.5	— 93 30.7
Greatest eclipse	18	14 42.5	— 101 52.2
Eclipse ends	18	15 28.3	— 124 27.5

Magnitude of greatest eclipse=0.086 (Sun's diameter=1.0).

VI.—*An Annular Eclipse of the Sun*, 1917, December 13, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, December 13 21 23 24.0			
	d	h	m
			s
Sun and Moon's R. A.	17	24	27.34
	.	'	"
Sun's declination	—23	11	54.5
Moon's declination	—24	4	57.9
Sun's equa. hor. parallax			8.9
Moon's equa. hor. parallax	58	2.5	
Hourly motions	11.05	and	149.88
Hourly motion	—	0	9.4
Hourly motion	+	1	0.1
Sun's true semidiameter			16 15.0
Moon's true semidiameter			15 48.2

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d	h	m
			s
Eclipse begins	Dec. 13	19 9.7	+ 36 6.9
Central eclipse begins	13	20 43.8	+ 87 52.7
Central eclipse at local apparent midnight		13 21 23.4	+142 12.8
Central eclipse ends		13 22 10.5	—155 41.2
Eclipse ends		13 23 44.5	—107 27.1

VII.—*A Total Eclipse of the Moon*, 1917, December 27, visible at Washington; the beginning visible generally in North and South America, throughout the Pacific Ocean, and the extreme northeastern portion of Asia; the ending visible generally in North America, throughout the Pacific Ocean, in eastern Asia, and Australia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, December 27									
	d	h	m	s		d	h	m	s
Sun's right ascension	18	26	39.29		Hourly motion				11.08
Moon's right ascension	6	26	39.29		Hourly motion				138.74
									" "
Sun's declination	-23	18	30.5		Hourly motion				+ 0 7.1
Moon's declination	+22	52	58.5		Hourly motion				- 4 28.5
Sun's equa. hor. parallax			8.9		Sun's true semidiameter				16 15.9
Moon's equa. hor. parallax	56	20.1			Moon's true semidiameter				15 20.3

CIRCUMSTANCES OF THE ECLIPSE.

	Dec.	d	h	m	} Greenwich Mean Time.
Moon enters penumbra	27	18	53.5		
Moon enters shadow	27	20	5.1		
Total eclipse begins	27	21	38.1		
Middle of the eclipse	27	21	46.3		
Total eclipse ends	27	21	54.6		
Moon leaves shadow	27	23	27.4		
Moon leaves penumbra	27	24	38.8		

Contacts of Shadow with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith	
		in Longitude from Greenwich	and in Latitude
First	72 to E.	+121 52	+23 1
Last	55 to W.	+170 39	+22 46

Magnitude of the eclipse=1.011 (Moon's diameter=1.0).

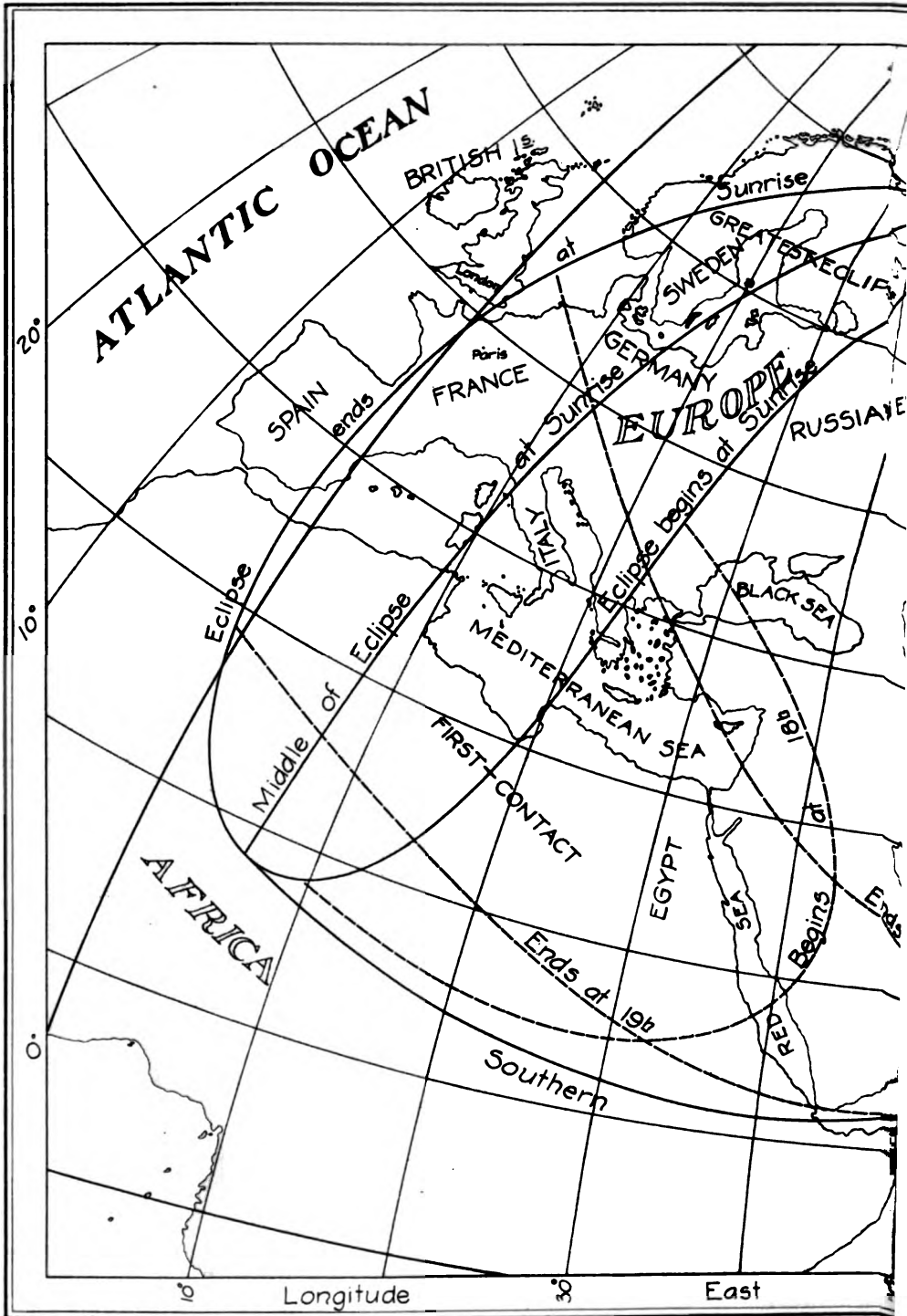
The regions within which the first, second, and fourth eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich mean times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun to fifteen or twenty minutes when the Sun is near the horizon.

**BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN,
1917, JANUARY 22.**

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	<i>μ</i>	<i>l</i>
h m					° '	
17 40	-1.36546	+0.75266	-9.52507	+9.97415	262 1.8	+0.53795
50	1.27351	0.78377	9.52504	9.97415	264 31.8	0.53796
18 0	-1.18156	+0.81488	-9.52501	+9.97416	267 1.8	+0.53796
10	1.08961	0.84600	9.52497	9.97416	269 31.7	0.53796
20	0.99765	0.87713	9.52494	9.97416	272 1.7	0.53797
30	0.90570	0.90826	9.52491	9.97417	274 31.7	0.53797
40	0.81374	0.93939	9.52487	9.97417	277 1.7	0.53797
50	0.72179	0.97053	9.52484	9.97418	279 31.7	0.53797
19 0	-0.62983	+1.00167	-9.52481	+9.97418	282 1.7	+0.53797
10	0.53788	1.03282	9.52478	9.97419	284 31.7	0.53797
20	0.44593	1.06397	9.52474	9.97419	287 1.7	0.53797
30	0.35397	1.09513	9.52471	9.97419	289 31.6	0.53797
40	0.26202	1.12629	9.52468	9.97420	292 1.6	0.53796
50	0.17007	1.15746	9.52465	9.97420	294 31.6	0.53796
20 0	-0.07812	+1.18863	-9.52461	+9.97421	297 1.6	+0.53796
10	+0.01382	1.21980	9.52458	9.97421	299 31.6	0.53795
20	0.10577	1.25098	9.52455	9.97421	302 1.6	0.53795
30	0.19771	1.28216	9.52451	9.97422	304 31.6	0.53794
40	0.28964	1.31335	9.52448	9.97422	307 1.6	0.53793
50	0.38158	1.34454	9.52445	9.97423	309 31.5	0.53792
21 0	+0.47351	+1.37573	-9.52442	+9.97423	312 1.5	+0.53791
10	0.56544	1.40693	9.52438	9.97423	314 31.5	0.53791
20	+0.65737	+1.43813	-9.52435	+9.97424	317 1.5	+0.53790

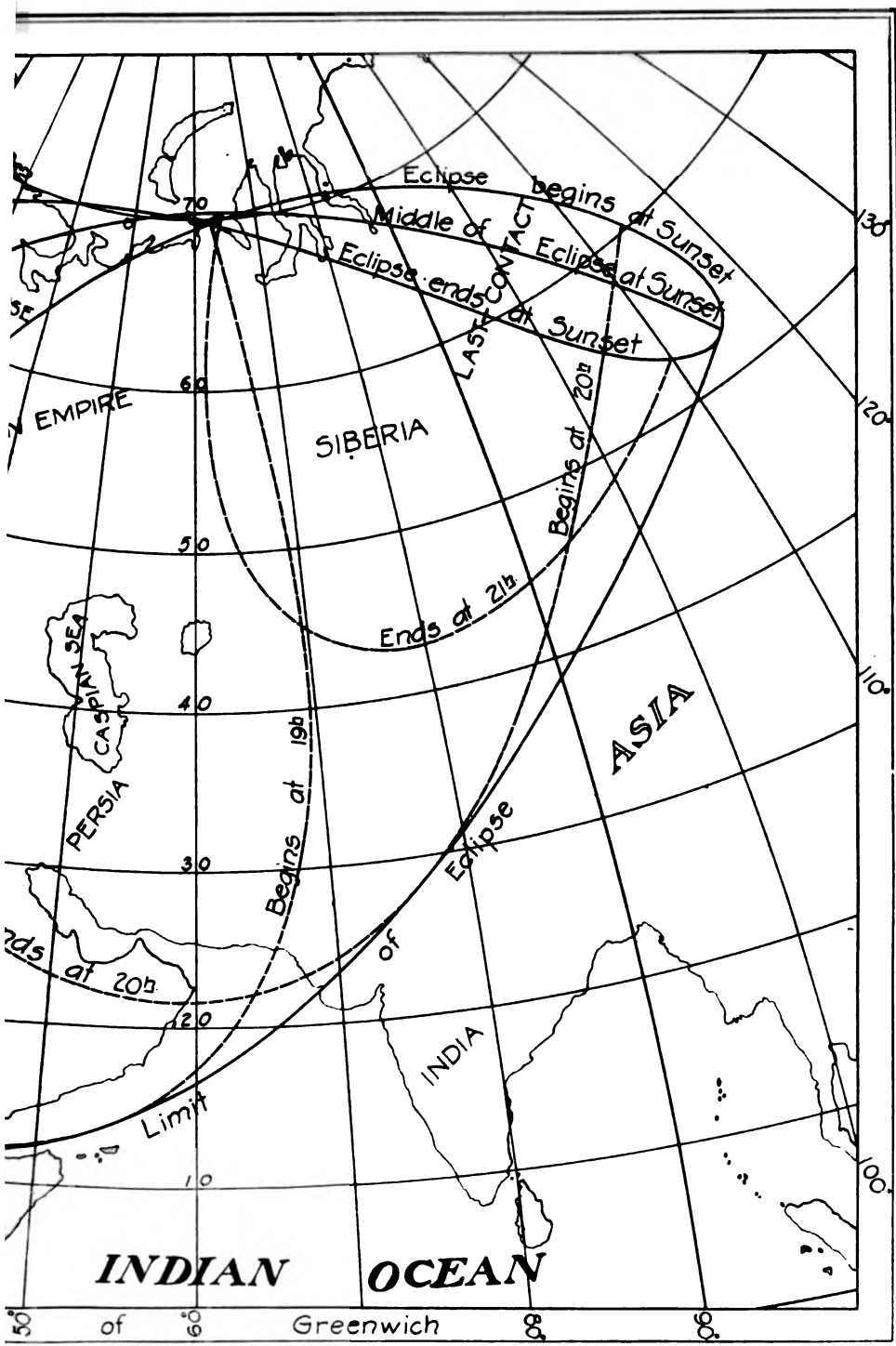
Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.	Log <i>y'</i> for 1 Minute.	Log <i>μ'</i> for 1 Minute.	Log Tangent of Angle of Cone.
				Penumbra.
h m				
17 0	+7.9635	+7.4925	+1.1761	+7.67665
18 0	7.9636	7.4930	1.1761	7.67665
19 0	7.9636	7.4934	1.1761	7.67665
20 0	7.9635	7.4938	1.1761	7.67665
21 0	7.9635	7.4941	1.1761	7.67664
22 0	+7.9633	+7.4943	+1.1761	+7.67664

PARTIAL ECLIPSE OF



Note:- The hours of beginning and ending

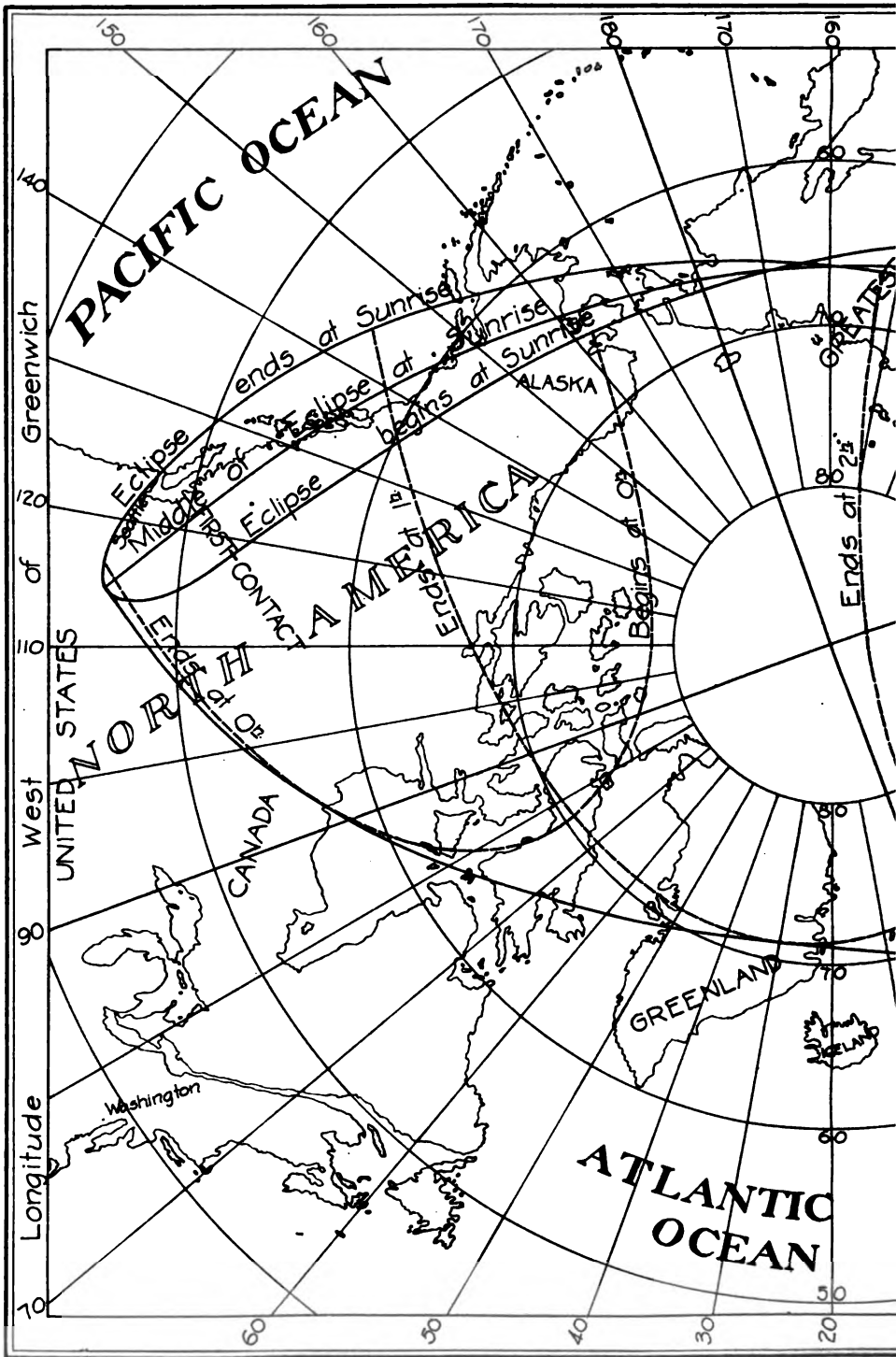
JANUARY 22nd 1917



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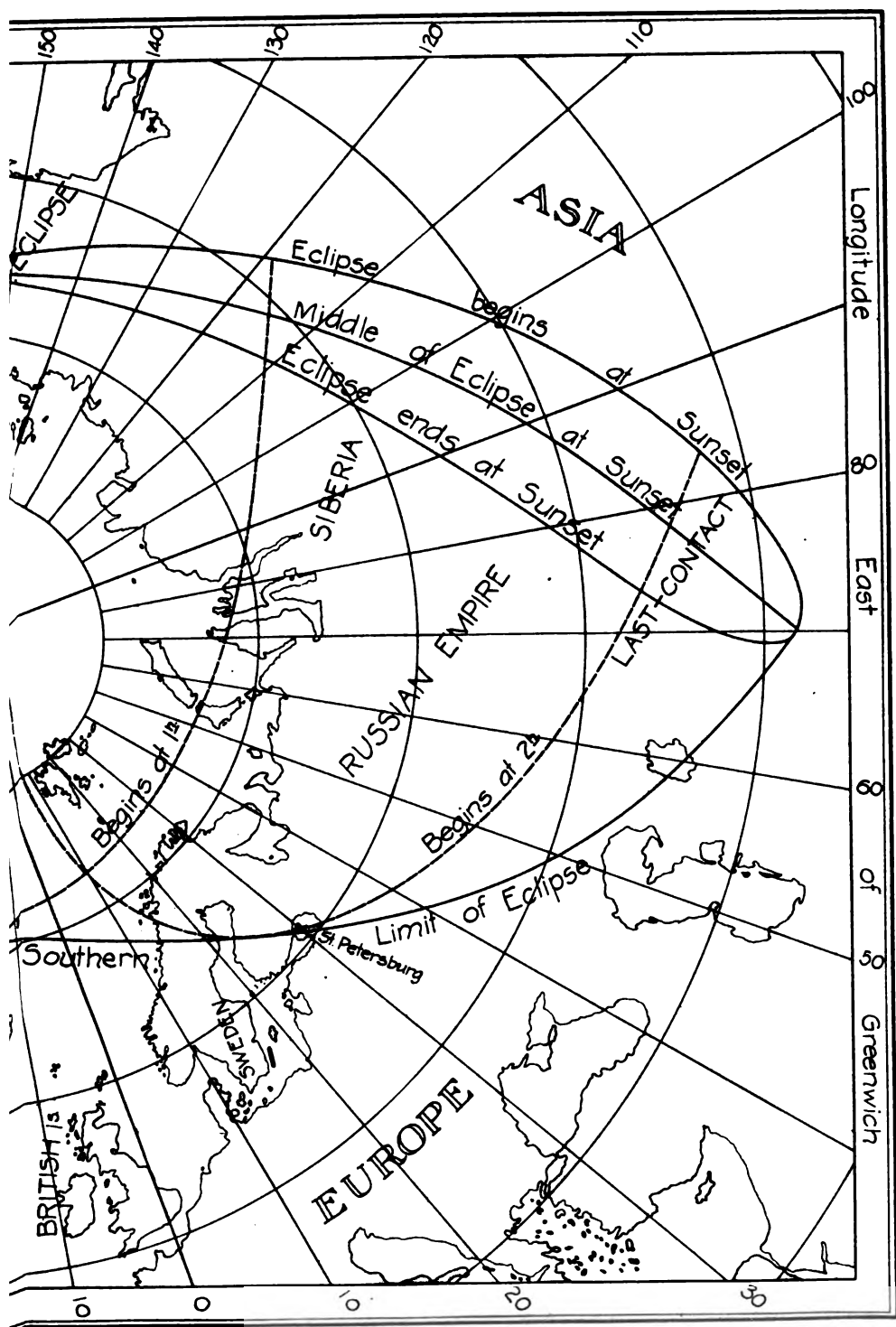
ing are expressed in Greenwich Mean Time

PARTIAL ECLIPSE



Note: The hours of beginning and ending

OF JUNE 18th 19th 1917.



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ing are expressed in Greenwich Mean Time.

**BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN,
1917, JUNE 18-19.**

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	<i>μ</i>	<i>l</i>
h m					° '	
23 30	-0.82353	+1.35363	+9.59939	+9.96264	352 15.0	+0.55664
40	0.73650	1.34691	9.59939	9.96264	354 45.0	0.55666
50	0.64946	1.34019	9.59940	9.96264	357 15.0	0.55668
0 0	-0.56242	+1.33345	+9.59940	+9.96264	359 45.0	+0.55670
10	0.47538	1.32670	9.59940	9.96264	2 15.0	0.55672
20	0.38834	1.31993	9.59940	9.96264	4 45.0	0.55674
30	0.30131	1.31316	9.59941	9.96264	7 14.9	0.55676
40	0.21427	1.30637	9.59941	9.96264	9 44.9	0.55678
50	0.12723	1.29958	9.59941	9.96264	12 14.9	0.55680
1 0	-0.04020	+1.29277	+9.59941	+9.96264	14 44.9	+0.55682
10	+0.04683	1.28594	9.59942	9.96264	17 14.9	0.55683
20	0.13387	1.27911	9.59942	9.96264	19 44.9	0.55685
30	0.22089	1.27227	9.59942	9.96264	22 14.9	0.55687
40	0.30792	1.26541	9.59942	9.96264	24 44.9	0.55688
50	0.39495	1.25854	9.59942	9.96264	27 14.9	0.55690
2 0	+0.48197	+1.25166	+9.59943	+9.96264	29 44.9	+0.55691
10	0.56899	1.24477	9.59943	9.96264	32 14.9	0.55692
20	0.65601	1.23787	9.59943	9.96264	34 44.8	0.55694
30	0.74302	1.23095	9.59943	9.96264	37 14.8	0.55695
40	0.83004	1.22403	9.59944	9.96264	39 44.8	0.55696
50	0.91704	1.21709	9.59944	9.96264	42 14.8	0.55697
3 0	+1.00405	+1.21014	+9.59944	+9.96263	44 44.8	+0.55699

Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.	Log <i>y'</i> for 1 Minute.	Log <i>μ'</i> for 1 Minute.	Log Tangent of Angle of Cone.
				Penumbra.
h m				
23 0	+7.9397	-6.8243	+1.1761	+7.66289
0 0	7.9397	6.8290	1.1761	7.66289
1 0	7.9397	6.8335	1.1761	7.66289
2 0	7.9396	6.8380	1.1761	7.66289
3 0	+7.9395	-6.8423	+1.1761	+7.66289

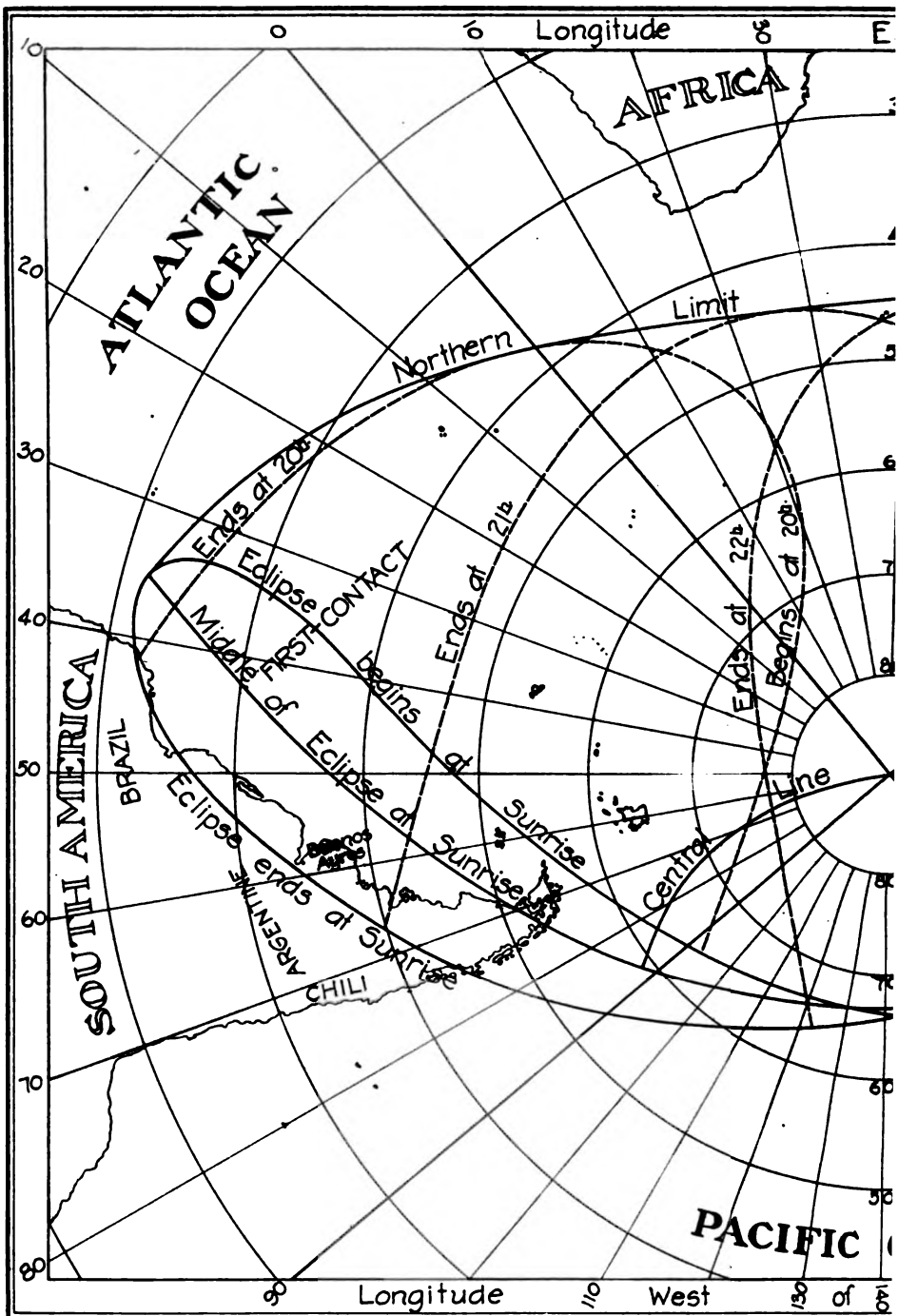
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**BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE OF THE SUN,
1917, JULY 18.**

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	x	y	$\text{Log sin } d$	$\text{Log cos } d$	μ	l
h m						
13 50	-0.85266	-1.32437	+9.55426	+9.97016	205 59.5	+0.56250
14 0	-0.77088	-1.34822	+9.55423	+9.97017	208 29.5	+0.56251
10	0.68911	1.37206	9.55421	9.97017	210 59.6	0.56253
20	0.60734	1.39591	9.55419	9.97017	213 29.6	0.56254
30	0.52556	1.41977	9.55416	9.97018	215 59.6	0.56255
40	0.44379	1.44362	9.55414	9.97018	218 29.6	0.56256
50	0.36202	1.46748	9.55412	9.97018	220 59.6	0.56257
15 0	-0.28025	-1.49135	+9.55409	+9.97019	223 29.6	+0.56258
10	0.19849	1.51522	9.55407	9.97019	225 59.6	0.56259
20	0.11672	1.53909	9.55405	9.97019	228 29.6	0.56260
30	-0.03496	-1.56297	+9.55402	+9.97020	230 59.6	+0.56261

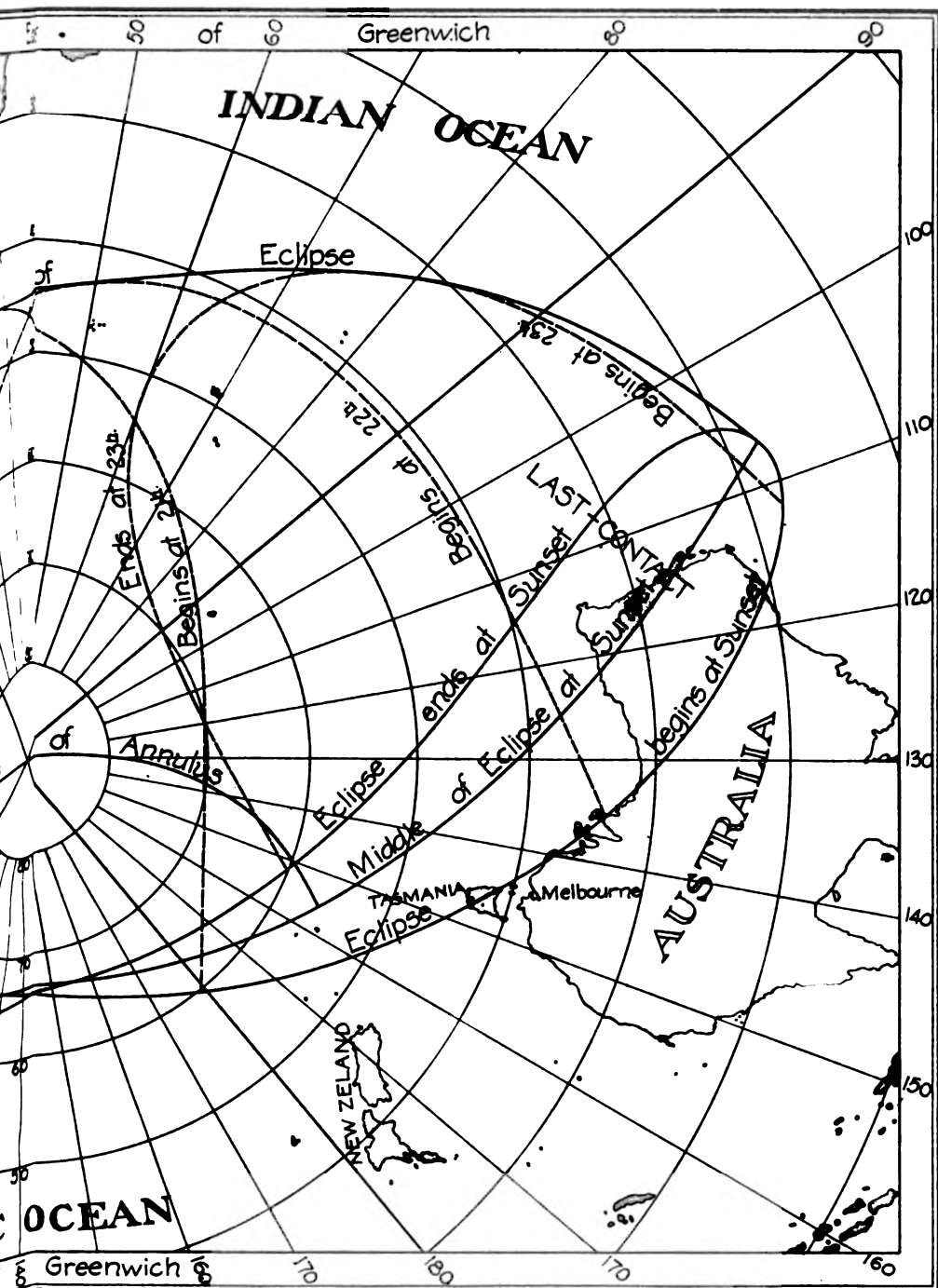
Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangent of Angle of Cone.
				Penumbra.
h m				
13 0	+7.9126	-7.3769	+1.1761	+7.66292
14 0	7.9126	7.3774	1.1761	7.66292
15 0	7.9126	7.3778	1.1761	7.66292
16 0	+7.9125	-7.3782	+1.1761	+7.66292

ANNULAR ECLIPSE



Note:- The hours of beginning and end.

OF DECEMBER 13th 1917



ending are expressed in Greenwich Mean Time.

ENGRAVED AND PRINTED BY THE U.S. GEOLOGICAL SURVEY

**BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN,
1917, DECEMBER 13.**

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	$\text{Log sin } d$	$\text{Log cos } d$	μ	l_1	l_2
h m							
19 0	-1.30792	-0.96399	-9.59525	+9.96341	286 22.3	+0.55386	+0.00791
10	1.21673	0.96076	9.59526	9.96341	288 52.3	0.55385	0.00790
20	1.12554	0.95751	9.59527	9.96341	291 22.3	0.55384	0.00788
30	1.03434	0.95425	9.59528	9.96341	293 52.2	0.55383	0.00787
40	0.94314	0.95098	9.59528	9.96341	296 22.2	0.55382	0.00786
50	0.85194	0.94770	9.59529	9.96341	298 52.2	0.55380	0.00785
20 0	-0.76073	-0.94440	-9.59530	+9.96340	301 22.1	+0.55379	+0.00783
10	0.66952	0.94110	9.59531	9.96340	303 52.1	0.55377	0.00782
20	0.57831	0.93778	9.59532	9.96340	306 22.0	0.55376	0.00780
30	0.48710	0.93445	9.59532	9.96340	308 52.0	0.55374	0.00779
40	0.39588	0.93111	9.59533	9.96340	311 22.0	0.55373	0.00777
50	0.30467	0.92775	9.59534	9.96340	313 51.9	0.55371	0.00775
21 0	-0.21345	-0.92438	-9.59535	+9.96340	316 21.9	+0.55369	+0.00774
10	0.12223	0.92101	9.59535	9.96339	318 51.9	0.55367	0.00772
20	-0.08101	0.91762	9.59536	9.96339	321 21.8	0.55365	0.00770
30	+0.06021	0.91421	9.59537	9.96339	323 51.8	0.55363	0.00768
40	0.15143	0.91080	9.59538	9.96339	326 21.8	0.55361	0.00766
50	0.24265	0.90737	9.59539	9.96339	328 51.7	0.55359	0.00764
22 0	+0.33388	-0.90394	-9.59539	+9.96339	331 21.7	+0.55357	+0.00762
10	0.42510	0.90049	9.59540	9.96339	333 51.7	0.55355	0.00759
20	0.51632	0.89703	9.59541	9.96338	336 21.6	0.55353	0.00757
30	0.60754	0.89355	9.59542	9.96338	338 51.6	0.55350	0.00755
40	0.69876	0.89007	9.59542	9.96338	341 21.6	0.55348	0.00752
50	0.78998	0.88657	9.59543	9.96338	343 51.5	0.55345	0.00750
23 0	+0.88120	-0.88307	-9.59544	+9.96338	346 21.5	+0.55343	+0.00747
10	0.97242	0.87955	9.59545	9.96338	348 51.5	0.55340	0.00745
20	1.06363	0.87602	9.59546	9.96338	351 21.4	0.55337	0.00742
30	1.15485	0.87247	9.59546	9.96337	353 51.4	0.55335	0.00739
40	1.24606	0.86892	9.59547	9.96337	356 21.3	0.55332	0.00736
50	+1.33727	-0.86535	-9.59548	+9.96337	358 51.3	+0.55329	+0.00734

Greenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
19 0	+7.9599	+6.5090	+1.1760	+7.67678	+7.67461
20 0	7.9600	6.5186	1.1760	7.67678	7.67461
21 0	7.9601	6.5279	1.1760	7.67678	7.67461
22 0	7.9601	6.5370	1.1760	7.67678	7.67461
23 0	7.9601	6.5457	1.1760	7.67678	7.67461
24 0	+7.9600	+6.5544	+1.1760	+7.67678	+7.67462

564 STARS OCCULTED BY THE MOON, 1917.

MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	°	'	"	"
36	Piscium . . .	6.2	0	12	18.061	-0.0027	+ 7	46	46.28	-0.006
d	Piscium . . .	5.4	0	16	19.561	+0.0003	7	43	45.86	+0.016
136 B.	Piscium . . .	6.5	0	36	54.451	-0.0084	8	54	8.23	-0.082
58	Piscium . . .	5.7	0	42	41.549	+0.0033	11	31	17.34	-0.025
75	Piscium . . .	6.3	1	2	11.506	+0.0012	12	30	41.64	+0.042
η	Piscium . . .	3.7	1	27	2.336	+0.0015	+14	55	6.06	-0.003
101	Piscium . . .	6.2	1	31	20.025	+0.0010	14	14	15.15	-0.001
105	Piscium . . .	6.1	1	35	11.944	+0.0083	15	59	6.69	-0.006
3	Arietis . . .	6.4	1	42	4.759	+0.0031	16	59	51.57	+0.015
4	Arietis . . .	5.8	1	43	40.616	+0.0035	16	32	34.23	-0.021
z	Arietis . . .	5.1	1	52	48.778	+0.0021	+17	24	45.99	-0.020
35 B.	Arietis . . .	6.4	1	59	9.265	-0.0068	17	51	17.54	-0.018
47 B.	Arietis . . .	6.5	2	3	12.281	-0.0037	17	38	4.20	-0.007
20 H.	Arietis . . .	6.4	2	4	49.346	+0.0112	16	50	8.00	-0.179
15	Arietis . . .	5.9	2	6	1.337	+0.0059	19	6	33.12	-0.032
θ	Arietis . . .	5.6	2	13	30.336	-0.0007	+19	31	4.04	-0.003
26	Arietis . . .	6.2	2	25	58.908	+0.0050	19	29	15.37	-0.022
μ	Arietis . . .	5.7	2	37	40.977	+0.0023	19	39	30.88	-0.038
47	Arietis . . .	5.8	2	53	19.960	+0.0160	20	20	12.17	-0.021
ε	Arietis (mean)	4.6	2	54	27.735	-0.0009	21	0	32.67	-0.010
ζ	Arietis . . .	5.0	3	10	7.630	-0.0019	+20	44	15.26	-0.082
τ	Arietis . . .	5.2	3	16	25.929	+0.0023	20	50	54.99	-0.033
63	Arietis . . .	5.2	3	17	58.432	-0.0082	20	26	45.94	-0.009
65	Arietis . . .	6.0	3	19	38.782	+0.0006	20	30	35.22	-0.008
66	Arietis . . .	6.1	3	23	35.276	+0.0006	22	31	7.40	-0.112
7	Tauri . . .	5.9	3	29	31.506	+0.0013	+24	11	12.88	-0.023
16	Tauri . . .	5.4	3	39	51.960	+0.0009	24	1	45.17	-0.049
17	Tauri . . .	3.8	3	39	56.601	+0.0016	23	51	11.68	-0.050
18	Tauri . . .	5.6	3	40	12.351	+0.0004	24	34	47.38	-0.038
q	Tauri . . .	4.3	3	40	15.798	+0.0010	24	12	28.48	-0.034
20	Tauri . . .	4.1	3	40	53.075	+0.0016	+24	6	33.49	-0.044
21	Tauri . . .	5.8	3	40	57.563	+0.0012	24	17	46.73	-0.046
22	Tauri . . .	6.5	3	41	6.003	+0.0006	24	16	11.48	-0.039
23	Tauri . . .	4.3	3	41	23.796	+0.0017	23	41	26.18	-0.050
η	Tauri . . .	3.0	3	42	32.843	+0.0016	23	50	57.71	-0.050
104 B.	Tauri . . .	5.5	3	43	25.782	+0.0008	+23	10	1.59	-0.045
27	Tauri . . .	3.7	3	44	13.414	+0.0013	23	48	1.89	-0.048
23	Tauri . . .	5.2	3	44	14.703	+0.0009	23	53	2.52	-0.046
133 B.	Tauri . . .	5.9	3	45	2.197	+0.0025	21	59	33.03	-0.042
32	Tauri . . .	5.8	3	51	57.597	+0.0045	22	14	23.34	-0.112
33	Tauri . . .	6.0	3	52	8.478	+0.0026	+22	56	7.97	-0.009
161 B.	Tauri . . .	6.5	3	56	1.098	+0.0027	22	58	4.20	-0.052
36	Tauri . . .	5.6	3	59	23.644	+0.0001	23	52	41.81	-0.022
192 B.	Tauri . . .	6.1	4	7	55.709	-0.0016	22	12	3.44	-0.019
χ	Tauri . . .	5.3	4	17	31.756	+0.0028	25	26	3.70	-0.029
62	Tauri . . .	6.1	4	18	59.363	+0.0008	+24	6	30.79	-0.019
ν	Tauri . . .	4.2	4	21	20.313	+0.0079	22	37	34.72	-0.047
72	Tauri . . .	5.4	4	22	19.497	+0.0004	22	48	37.13	-0.008
284 B.	Tauri . . .	6.0	4	31	29.183	+0.0109	23	10	19.34	-0.102
τ	Tauri . . .	4.3	4	37	15.692	+0.0007	22	47	55.34	-0.019
95	Tauri . . .	6.2	4	38	12.128	+0.0014	+23	55	57.12	-0.030

MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
		h	m	s		°	'	"	
300 B. Tauri	6.2	4	40	41.687	+0.0006	+23	28	36.43	+0.004
315 B. Tauri	6.3	4	51	12.205	-0.0001	24	27	37.89	-0.033
99 Tauri	6.0	4	52	46.381	+0.0003	23	49	11.34	-0.035
<i>k</i> Tauri	5.6	4	53	4.532	+0.0023	24	55	23.31	-0.061
103 Tauri	5.5	5	3	3.077	+0.0003	24	9	22.94	-0.021
118 Tauri	5.4	5	24	9.974	+0.0015	+25	5	3.37	-0.038
121 Tauri	5.1	5	30	22.901	+0.0010	23	59	7.42	-0.031
125 Tauri	5.1	5	34	35.552	+0.0018	25	51	5.78	-0.029
394 B. Tauri	6.0	5	38	17.090	+0.0011	23	9	56.91	-0.042
132 Tauri	5.0	5	43	55.306	0.0000	24	32	26.80	-0.023
412 B. Tauri	5.8	5	51	51.154	.....	+24	14	18.91	.....
139 Tauri	4.7	5	52	50.641	0.0000	25	56	40.93	-0.007
1 Geminorum	4.3	5	59	4.505	+0.0002	23	16	7.83	-0.109
3 Geminorum	5.6	6	4	41.651	+0.0014	23	7	41.32	+0.001
5 Geminorum	5.9	6	6	26.941	+0.0011	24	26	22.44	-0.061
6 Geminorum	6.3	6	7	17.244	+0.0007	+22	55	41.85	-0.013
<i>η</i> Geminorum (<i>var.</i>) .	3.2	6	9	52.098	-0.0038	22	31	54.92	-0.016
8 Geminorum	6.1	6	11	14.787	-0.0009	23	59	52.01	-0.026
9 Geminorum	6.2	6	11	54.920	+0.0004	23	46	12.13	-0.008
<i>μ</i> Geminorum	3.2	6	17	56.386	+0.0046	22	33	26.30	-0.114
36 B. Geminorum . . .	6.0	6	20	30.284	-0.0004	+23	22	27.44	+0.015
52 B. Geminorum . . .	6.5	6	32	21.972	-0.0021	24	39	38.50	-0.002
<i>ε</i> Geminorum	3.2	6	38	49.590	-0.0001	25	12	51.95	-0.018
<i>δ</i> Geminorum	5.2	6	46	34.693	+0.0003	21	51	36.19	-0.045
87 B. Geminorum . . .	5.8	6	46	57.780	-0.0006	23	42	2.93	-0.021
<i>ω</i> Geminorum	5.2	6	57	21.435	-0.0003	+24	20	5.47	0.000
<i>ζ</i> Geminorum (<i>var.</i>) .	3.7	6	59	11.248	-0.0009	20	41	35.05	-0.007
44 Geminorum	5.9	7	0	18.650	0.0000	22	45	45.91	-0.020
120 B. Geminorum . .	6.5	7	5	11.403	-0.0062	21	23	33.90	-0.448
<i>δ</i> Geminorum	3.5	7	15	10.085	-0.0010	22	8	10.35	-0.015
56 Geminorum	5.2	7	17	3.070	-0.0044	+20	36	7.48	-0.025
58 Geminorum	6.0	7	18	28.960	-0.0022	23	6	21.33	-0.054
149 B. Geminorum . .	6.4	7	21	56.062	-0.0219	21	42	9.15	-0.022
61 Geminorum	5.8	7	22	2.878	-0.0002	20	25	27.48	-0.023
63 Geminorum	5.3	7	22	48.886	-0.0035	21	36	58.09	-0.110
79 Geminorum	6.3	7	40	17.070	-0.0013	+20	30	58.44	-0.012
<i>γ</i> Geminorum	5.0	7	41	19.247	-0.0048	18	42	48.58	-0.063
209 B. Geminorum . .	6.2	7	47	7.258	-0.0029	19	32	18.85	-0.030
85 Geminorum	5.2	7	50	49.393	-0.0011	20	6	14.43	-0.043
217 B. Geminorum . .	6.3	7	55	57.875	-0.0018	20	2	40.83	-0.007
3 Cancrī	5.7	7	56	2.077	-0.0001	+17	32	13.11	-0.010
10 H. Cancrī	6.1	7	59	57.582	-0.0020	19	4	38.61	-0.046
<i>ζ</i> Cancrī (<i>mean</i>) . .	4.7	8	7	27.241	+0.0061	17	53	56.75	-0.129
<i>d</i> ¹ Cancrī	5.9	8	18	36.816	-0.0038	18	35	58.31	-0.031
<i>d</i> ² Cancrī	6.2	8	21	8.140	-0.0132	17	19	14.35	-0.153
θ Cancrī	5.5	8	26	51.941	-0.0039	+18	22	32.20	-0.068
90 B. Cancrī	6.3	8	31	28.571	+0.0006	15	36	5.07	-0.027
54 Cancrī	6.3	8	46	24.249	-0.0075	15	39	33.47	+0.076
<i>o</i> ¹ Cancrī	5.1	8	52	37.325	+0.0041	15	38	30.60	+0.022
<i>o</i> ² Cancrī	5.7	8	52	57.216	+0.0043	15	54	2.86	+0.023
209 B. Cancrī	6.5	9	5	15.952	-0.0008	+11	54	11.11	-0.079

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MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	°	'	"	"
81	Cancer	6.4	9	7	45.207	-0.0359	+15	19	52.49	+0.244
222	B. Cancer	6.3	9	13	21.711	+0.0046	11	50	57.72	-0.007
ξ	Leonis	5.1	9	27	28.447	-0.0063	11	40	4.89	-0.064
λ	Leonis	5.2	9	27	30.786	+0.0001	10	4	56.78	-0.013
ο	Leonis	3.8	9	36	43.370	-0.0096	10	16	14.25	-0.033
83	B. Leonis	5.9	9	52	2.016	-0.0075	+ 9	19	37.42	+0.017
89	B. Leonis	6.2	9	53	43.926	+0.0010	8	42	38.46	-0.029
π	Leonis	4.9	9	55	49.720	-0.0029	8	26	34.70	-0.027
14	Sextantis	6.3	10	2	27.099	-0.0022	6	1	0.98	-0.002
43	Leonis	6.3	10	18	39.932	-0.0017	6	57	52.26	-0.101
155	B. Leonis	6.5	10	18	56.009	-0.0167	+ 6	6	56.43	-0.071
35	Sextantis	6.1	10	39	2.515	+0.0018	5	11	1.26	-0.019
237	B. Leonis	6.3	10	47	57.895	+0.0002	1	27	55.02	-0.055
55	Leonis	6.1	10	51	26.255	+0.0073	1	10	46.69	-0.013
p ³	Leonis	6.1	10	59	21.719	-0.0045	0	26	47.06	+0.006
p ⁴	Leonis	5.7	11	2	40.246	-0.0253	+ 2	24	23.26	-0.080
p ⁵	Leonis	5.3	11	9	30.665	-0.0029	0	22	56.19	-0.003
359	B. Leonis	6.3	11	19	2.972	-0.0024	+ 0	35	16.21	-0.015
388	B. Leonis	6.3	11	23	39.253	-0.0026	- 1	14	34.43	+0.007
e	Leonis	5.1	11	26	4.456	+0.0018	2	32	42.85	-0.009
431	B. Leonis	6.2	11	34	9.581	-0.0028	- 1	58	37.02	+0.047
13	B. Virginis	5.9	11	46	47.668	+0.0008	4	52	17.75	+0.006
64	B. Virginis	6.5	12	6	11.672	-0.0004	7	18	45.30	+0.017
78	B. Virginis	6.5	12	10	0.320	-0.0061	5	15	27.62	+0.114
q	Virginis	5.3	12	29	29.633	-0.0067	8	59	39.19	+0.004
370	B. Virginis	6.0	12	49	59.434	-0.0068	-11	11	55.66	-0.037
69	Virginis	4.9	13	23	1.377	-0.0086	15	32	36.72	+0.013
75	Virginis	5.6	13	28	25.411	-0.0060	14	56	10.72	+0.004
83	Virginis	5.6	13	40	0.939	+0.0007	15	45	43.43	-0.011
85	Virginis	6.1	13	41	6.770	-0.0029	15	21	3.19	-0.034
87	Virginis	5.8	13	42	54.232	+0.0025	-17	26	41.30	-0.046
89	Virginis	5.1	13	45	21.487	-0.0077	17	43	16.12	-0.040
214	G. Virginis	6.5	14	0	42.318	-0.0036	15	56	20.31	-0.012
43	H. Virginis	5.5	14	10	49.466	-0.0081	17	48	50.20	-0.015
231	G. Virginis	6.4	14	12	28.259	-0.0005	18	12	0.11	+0.106
236	G. Virginis	5.7	14	14	2.704	-0.0039	-18	19	54.48	-0.001
9	G. Libræ	6.5	14	30	10.364	+0.0032	20	4	32.31	-0.004
17	G. Libræ	6.4	14	41	28.209	-0.0047	20	49	28.80	-0.121
18	G. Libræ	6.1	14	42	30.284	-0.0082	20	58	38.29	-0.014
43	B. Libræ	5.7	14	52	36.945	+0.0746	21	2	32.52	-1.792
47	G. Libræ	6.1	15	1	39.657	+0.0066	-21	42	34.40	-0.050
64	G. Libræ	5.8	15	11	34.108	-0.0028	22	5	34.49	+0.018
153	B. Libræ	6.3	15	28	14.106	-0.0006	24	12	29.89	-0.042
169	B. Libræ	6.0	15	32	55.078	-0.0017	22	52	0.86	-0.068
177	B. Libræ	6.2	15	34	28.253	-0.0016	22	52	46.25	-0.034
42	Libræ	5.0	15	35	22.266	-0.0018	-23	32	56.98	-0.027
λ	Scorpii	4.6	15	48	37.514	-0.0017	25	4	48.20	-0.023
31	B. Scorpii	5.4	15	48	56.179	-0.0022	24	17	12.36	-0.037
32	B. Scorpii	5.3	15	48	59.250	-0.0023	23	43	53.18	-0.016
3	Scorpii	5.9	15	49	40.271	-0.0031	-24	59	54.58	-0.029

MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
40 B. Scorpii . . .	5.4	15 53 35.970	-0.0031	-24 35 33.59	+0.004
δ Scorpii . . .	2.5	15 55 25.331	-0.0012	22 23 11.19	-0.035
48 B. Scorpii . . .	4.9	15 58 19.493	-0.0048	25 38 5.25	-0.043
50 B. Scorpii . . .	6.4	15 58 55.524	+0.0017	24 29 53.90	-0.032
57 B. Scorpii . . .	5.7	16 1 9.190	-0.0011	23 22 50.27	-0.005
24 G. Scorpii . . .	6.2	16 2 52.845	0.0000	-24 14 27.16	-0.068
27 G. Scorpii . . .	5.8	16 3 46.260	+0.0032	23 27 52.47	-0.012
41 G. Scorpii . . .	6.3	16 8 45.844	-0.0004	24 12 38.64	-0.034
85 B. Scorpii . . .	6.0	16 9 51.473	-0.0005	25 16 1.31	+0.012
19 Scorpii . . .	4.9	16 15 38.310	-0.0012	23 58 12.35	-0.013
σ Scorpii . . .	3.1	16 16 8.421	-0.0011	-25 23 40.82	-0.039
ρ Ophiuchi . . .	4.7	16 20 36.261	-0.0015	23 15 22.79	-0.008
α Scorpii (<i>Antares</i>) . . .	1.2	16 24 18.923	-0.0006	26 14 55.76	-0.028
22 Scorpii . . .	4.8	16 25 9.754	-0.0004	24 55 59.86	-0.016
116 B. Scorpii . . .	6.2	16 26 17.073	-0.0013	26 21 28.40	-0.037
126 B. Scorpii . . .	6.1	16 36 34.259	-0.0024	-24 18 28.39	-0.004
24 Ophiuchi . . .	5.5	16 51 47.594	+0.0002	23 1 10.92	-0.034
88 B. Ophiuchi . . .	6.3	16 54 52.692	+0.0005	24 58 1.46	-0.015
26 Ophiuchi . . .	5.8	16 55 4.318	+0.0036	24 51 47.95	-0.053
118 B. Ophiuchi . . .	6.2	17 1 44.501	-0.0006	26 24 6.72	-0.046
137 B. Ophiuchi . . .	6.3	17 7 7.937	+0.0058	-25 9 12.73	-0.045
36 Ophiuchi (<i>First Star</i>) . . .	5.4	17 10 14.447	-0.0340	26 28 55.83	-1.160
39 Ophiuchi . . .	5.1	17 12 56.852	-0.0046	24 11 51.01	-0.011
θ Ophiuchi . . .	3.4	17 16 54.620	-0.0006	24 55 4.13	-0.036
191 B. Ophiuchi . . .	6.3	17 20 1.734	+0.0010	24 10 7.19	+0.017
b Ophiuchi . . .	4.3	17 21 17.948	-0.0009	-24 6 0.68	-0.137
136 G. Ophiuchi . . .	6.3	17 21 47.060	-0.0010	25 52 15.11	-0.003
51 Ophiuchi . . .	4.8	17 26 21.022	0.0000	23 53 58.09	-0.030
151 G. Ophiuchi . . .	6.0	17 26 35.150	+0.0012	26 12 25.23	-0.026
63 Ophiuchi . . .	6.1	17 49 47.596	-0.0001	24 52 17.96	-0.015
4 Sagittarii . . .	4.8	17 54 43.475	+0.0001	-23 48 34.52	-0.058
21 G. Sagittarii . . .	5.7	17 56 52.623	-0.0013	22 46 45.50	-0.044
7 Sagittarii . . .	5.5	17 57 45.883	-0.0008	24 16 57.22	-0.007
9 Sagittarii . . .	6.0	17 58 47.035	-0.0006	24 21 48.31	-0.006
1 Sagittarii . . .	5.2	18 6 39.480	+0.0018	23 43 9.19	-0.042
67 B. Sagittarii . . .	6.4	18 13 33.366	-0.0044	-25 38 12.95	-0.062
70 B. Sagittarii . . .	6.4	18 16 24.841	+0.0014	24 57 12.94	-0.001
λ Sagittarii . . .	2.9	18 22 50.911	-0.0033	25 28 7.64	-0.199
24 Sagittarii . . .	5.7	18 28 49.279	-0.0002	24 5 43.14	-0.020
117 B. Sagittarii . . .	5.8	18 33 27.791	-0.0015	23 34 36.15	-0.020
26 Sagittarii . . .	6.1	18 36 47.917	+0.0021	-23 54 42.11	-0.023
126 B. Sagittarii . . .	5.7	18 39 43.447	-0.0008	25 5 43.64	-0.041
28 Sagittarii . . .	5.6	18 41 20.326	+0.0018	22 28 47.72	+0.010
30 Sagittarii . . .	6.2	18 45 51.080	-0.0041	22 15 28.83	-0.024
33 Sagittarii . . .	5.8	18 49 2.466	-0.0008	21 27 44.46	-0.015
γ ¹ Sagittarii . . .	5.0	18 49 9.568	+0.0001	-22 50 53.04	-0.022
γ ² Sagittarii . . .	5.1	18 50 6.114	+0.0069	22 46 33.42	-0.024
154 B. Sagittarii . . .	5.9	18 50 59.155	-0.0010	23 16 49.94	-0.021
36 Sagittarii . . .	5.1	18 52 24.529	-0.0010	20 45 57.13	-0.011
ξ Sagittarii . . .	3.7	18 52 46.722	+0.0023	-21 13 0.46	-0.023

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MEAN PLACES FOR 1917.0. (January 0^d.431, Greenwich.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	°	'	"	"
168 B.	Sagittarii	6.3	18	56	37.599	+0.0005	-22	48	47.45	+0.009
o	Sagittarii	3.9	18	59	42.583	+0.0050	21	51	50.76	-0.063
191 B.	Sagittarii	6.5	19	3	43.633	-0.0011	23	19	19.94	-0.058
π	Sagittarii	3.0	19	4	49.713	-0.0005	21	9	23.62	-0.036
199 B.	Sagittarii	6.4	19	7	30.461	-0.0003	21	47	49.75	-0.040
222 B.	Sagittarii	5.5	19	15	39.745	-0.0016	-22	33	28.51	+0.026
50	Sagittarii	5.5	19	21	22.193	+0.0019	21	56	30.86	+0.001
253 B.	Sagittarii	6.1	19	25	58.579	+0.0026	21	29	8.75	-0.028
266 B.	Sagittarii	6.1	19	31	35.803	+0.0003	19	2	13.39	-0.009
f	Sagittarii	5.1	19	41	31.295	-0.0099	19	57	41.56	-0.088
57	Sagittarii	6.0	19	47	22.702	+0.0001	-19	15	23.95	-0.057
σ	Capricorni	5.5	20	14	36.382	-0.0002	19	22	42.17	-0.006
π	Capricorni	5.2	20	22	34.314	+0.0004	18	29	4.29	-0.002
31 B.	Capricorni	6.4	20	24	3.064	+0.0013	16	1	0.64	+0.019
ρ	Capricorni	5.0	20	24	7.690	-0.0013	18	5	20.02	-0.020
o	Capricorni	5.6	20	25	8.531	+0.0012	-18	51	31.30	-0.061
27 G.	Capricorni	6.2	20	26	25.300	-0.0058	15	20	5.34	-0.092
47 B.	Capricorni	6.2	20	30	50.554	+0.0055	16	48	42.46	-0.033
r	Capricorni	5.2	20	34	38.003	+0.0006	15	14	47.84	-0.015
61 B.	Capricorni	5.9	20	35	52.876	-0.0032	16	25	12.50	+0.082
94 B.	Capricorni	5.7	20	53	2.004	+0.0046	-16	21	4.93	+0.030
95 B.	Capricorni	5.9	20	54	6.283	....	14	48	15.32	....
γ	Aquarii	4.5	21	5	4.447	+0.0057	11	42	30.02	-0.006
53 B.	Aquarii	6.5	21	11	26.929	+0.0004	13	32	48.83	-0.039
18	Aquarii	5.5	21	19	39.440	+0.0054	13	14	6.00	+0.007
19	Aquarii	5.6	21	20	45.525	+0.0012	-10	6	9.10	-0.164
72 B.	Aquarii	6.5	21	23	44.115	-0.0045	11	55	42.05	+0.008
137 B.	Capricorni	6.2	21	35	0.512	+0.0001	10	57	2.84	-0.010
c ¹	Capricorni	5.3	21	40	34.815	+0.0004	9	27	50.63	+0.008
c ²	Capricorni	6.3	21	41	50.672	+0.0008	9	39	34.32	+0.001
λ	Capricorni	5.5	21	42	4.124	+0.0015	-11	44	57.30	-0.004
96 B.	Aquarii	6.5	21	49	9.841	-0.0001	10	42	10.48	+0.006
30	Aquarii	5.6	21	58	54.494	+0.0011	6	55	25.82	+0.016
θ	Aquarii	4.3	22	12	27.295	+0.0074	8	11	49.13	-0.018
44	Aquarii	5.7	22	12	46.581	-0.0003	5	48	7.35	+0.029
ρ	Aquarii	5.3	22	15	49.967	+0.0008	- 8	14	18.57	-0.008
170 B.	Aquarii	6.0	22	19	11.092	+0.0012	7	36	51.56	+0.034
51	Aquarii	5.8	22	19	47.505	+0.0011	5	15	26.67	-0.011
186 B.	Aquarii	6.1	22	26	57.266	+0.0129	6	58	45.38	-0.129
187 B.	Aquarii	6.3	22	27	0.907	-0.0051	3	20	11.42	-0.004
κ	Aquarii	5.2	22	33	27.532	-0.0049	- 4	39	23.29	-0.113
207 B.	Aquarii	6.3	22	36	30.325	....	3	59	10.07	....
6 G.	Piscium	6.2	22	53	59.129	+0.0002	2	50	24.24	-0.082
3	Piscium	6.3	22	56	22.554	+0.0028	0	15	36.20	+0.014
22 B.	Piscium	6.4	23	19	16.465	+0.0043	- 0	9	51.61	+0.038
κ	Piscium	4.9	23	22	40.659	+0.0056	+ 0	48	4.07	-0.093
9	Piscium	6.4	23	22	59.697	+0.0032	0	39	59.78	-0.029
16	Piscium	5.7	23	32	9.143	-0.0074	1	38	29.43	+0.057
19	Piscium	5.4	23	42	8.970	-0.0034	3	1	34.68	-0.020
ω	Piscium	4.0	23	55	2.897	+0.0102	+ 6	24	13.92	-0.108

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.		Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H .	Y	x'	y'	N.	S.	
			$\Delta\alpha$	$\Delta\delta$									
			$^{\circ}$	$''$	$^{\circ}$	d	h	m	$^{\circ}$	h	m	$^{\circ}$	$^{\circ}$
77	Piscium	3.7	+1.30	+10.8	+14 55.3	1	5	3.1	- 1 40.8	-0.1227	0.5351	+0.2082	+35 -42
101	Piscium	6.2	1.33	10.6	14 14.4	7	5.4	+ 0 17.6	+1.0164	0.5357	0.2055	+90 +21	
105	Piscium	6.1	1.35	11.1	15 59.3	8	55.4	+ 2 4.0	-0.4510	0.5361	0.2029	+17 -60	
3	Arietis	6.4	1.40	11.4	17 0.1	12	10.6	+ 5 12.8	-0.8678	0.5370	0.1981	- 7 -73	
4	Arietis	5.8	1.41	11.2	16 32.8	12	55.9	+ 5 56.6	-0.2387	0.5372	0.1970	+29 -47	
1	Arietis	5.1	+1.47	+11.4	+17 25.0	17	14.0	+10 6.3	-0.3255	0.5383	+0.1905	+24 -51	
35 B.	Arietis	6.4	1.51	11.5	17 51.5	20	12.5	-11 1.1	-0.2344	0.5392	0.1858	+29 -46	
47 B.	Arietis	6.5	1.54	11.4	17 38.3	22	6.3	- 9 11.0	+0.3488	0.5398	0.1828	+62 -15	
20 H ¹ .	Arietis	6.4	1.54	11.1	16 50.3	22	51.6	- 8 27.1	+1.3349	0.5400	0.1815	+72 +60	
15	Arietis	5.9	1.56	11.8	19 6.7	23	25.2	- 7 54.6	-0.9777	0.5402	0.1806	-15 -71	
6	Arietis	5.6	+1.61	+11.8	+19 31.3	2	54.5	- 4 32.3	-0.7937	0.5413	+0.1747	- 3 -70	
26	Arietis	6.2	1.69	11.6	19 29.5	8	41.6	+ 1 3.2	+0.2196	0.5431	0.1646	+54 -19	
μ	Arietis	5.7	1.76	11.4	19 39.7	14	5.2	+ 6 16.0	+0.8998	0.5448	0.1548	+90 +19	
47	Arietis	5.8	1.86	11.2	20 20.4	21	15.0	-10 48.7	+1.2370	0.5470	0.1410	+87 +49	
ϵ	Arietis (mean)	4.6	1.88	11.3	21 0.7	21	45.9	-10 18.8	+0.5885	0.5472	0.1400	+83 + 3	
66	Arietis	6.1	+2.06	+10.7	+22 31.3	3	10 57.2	+ 2 25.5	+0.6384	0.5510	+0.1129	+89 + 8	
7	Tauri	5.9	2.11	11.0	24 11.4	13	37.3	+ 5 0.0	-0.8679	0.5517	0.1072	- 9 -66	
16	Tauri	5.4	2.17	10.5	24 1.9	18	15.4	+ 9 28.6	-0.2250	0.5528	0.0971	+29 -36	
17	Tauri	3.8	2.17	10.5	23 51.4	18	17.5	+ 9 30.6	-0.0314	0.5528	0.0970	+40 -25	
18	Tauri	5.6	2.18	10.7	24 35.0	18	24.5	+ 9 37.4	-0.8057	0.5528	0.0967	- 5 -65	
γ	Tauri	4.3	+2.17	+10.6	+24 12.7	18	26.1	+ 9 38.9	-0.4011	0.5528	+0.0967	+19 -46	
20	Tauri	4.1	2.17	10.5	24 6.7	18	42.7	+ 9 55.0	-0.2677	0.5529	0.0961	+26 -38	
21	Tauri	5.8	2.18	10.6	24 18.0	18	44.7	+ 9 56.9	-0.4667	0.5529	0.0960	+15 -50	
22	Tauri	6.5	2.18	10.6	24 16.4	18	48.5	+10 0.6	-0.4321	0.5529	0.0958	-17 -48	
23	Tauri	4.3	2.17	10.4	23 41.6	18	56.5	+10 8.3	+0.2071	0.5529	0.0955	+54 -13	
77	Tauri	3.0	+2.18	+10.4	+23 51.1	19	27.8	+10 38.0	+0.0843	0.5531	+0.0944	+46 -19	
104 B.	Tauri	5.5	2.18	10.2	23 10.2	19	51.0	+11 0.9	+0.8595	0.5532	0.0935	+90 +23	
27	Tauri	3.7	2.19	10.3	23 48.2	20	12.3	+11 21.4	+0.2073	0.5532	0.0928	+54 -12	
28	Tauri	5.2	2.19	10.3	23 53.2	20	12.8	+11 21.9	+0.1178	0.5532	0.0927	+49 -17	
36	Tauri	5.6	2.27	9.6	23 52.9	4	2 58.0	- 6 6.8	-0.7002	0.5545	0.0775	+90 +16	
χ	Tauri	5.3	+2.38	+ 9.1	+25 26.2	11	1.2	+ 1 39.5	-0.4397	0.5557	+0.0588	+17 -45	
62	Tauri	6.1	2.37	8.7	24 6.7	11	40.1	+ 2 17.1	+1.0402	0.5558	0.0574	+90 +39	
315 B.	Tauri	6.3	2.52	7.1	24 27.8	5	1 55.9	- 7 57.0	+1.2419	0.5564	0.0238	+80 +61	
k	Tauri	5.6	2.53	7.1	24 55.5	2	45.6	- 7 9.0	+0.7556	0.5564	+0.0218	+90 +24	
118	Tauri	5.4	2.64	5.2	25 5.1	16	33.3	+ 6 9.8	+0.6574	0.5552	-0.0109	+90 +20	
125	Tauri	5.1	+2.69	+ 4.7	+25 51.2	21	12.2	+10 39.1	-0.2805	0.5544	-0.0218	+27 -30	
132	Tauri	5.0	2.69	3.9	24 32.5	6	1 22.6	- 9 19.2	+1.0691	0.5535	0.0316	+90 +44	
412 B.	Tauri	5.8	2.70	3.4	24 14.4	4	56.2	- 5 52.9	+1.2756	0.5527	0.0397	+66 +65	
139	Tauri	4.7	2.74	3.5	25 56.7	5	22.9	- 5 27.1	-0.6195	0.5526	0.0408	+ 6 -56	
5	Geminorum	5.9	2.74	2.4	24 26.4	11	31.3	+ 0 28.7	+0.7449	0.5508	0.0547	+90 +20	
8	Geminorum	6.1	+2.74	+ 2.1	+23 59.9	13	41.8	+ 2 34.8	+1.1080	0.5501	-0.0596	+90 +44	
52 B.	Geminorum	6.5	2.78	0.7	24 39.7	23	20.8	+11 54.2	-0.2991	0.5465	0.0806	+24 -38	
ϵ	Geminorum	3.2	2.80	+ 0.3	25 12.9	7	2 19.6	- 9 13.0	-1.1606	0.5454	0.0869	-34 -65	
87 B.	Geminorum	5.8	2.78	- 0.4	23 42.0	6	5.8	- 5 34.2	+0.1698	0.5437	0.0947	+52 -14	
ω	Geminorum	5.2	2.80	1.1	24 20.1	10	57.0	- 0 52.7	-1.0150	0.5415	0.1045	-20 -66	
44	Geminorum	5.9	+2.76	- 1.3	+22 45.7	12	20.2	+ 0 27.7	+0.5781	0.5409	-0.1072	+82 + 5	
6	Geminorum	3.5	2.76	2.3	22 8.1	19	21.6	+ 7 15.6	+0.4714	0.5375	0.1207	+72 - 2	
58	Geminorum	6.0	2.77	2.5	23 6.3	20	56.4	+ 8 47.2	-0.7960	0.5367	0.1237	- 4 -67	
149 B.	Geminorum	6.4	2.74	2.8	21 42.1	22	35.4	+10 23.0	+0.5526	0.5358	0.1267	+80 + 2	
63	Geminorum	5.3	2.74	2.8	21 36.9	23	0.7	+10 47.5	+0.5948	0.5356	0.1275	+84 + 4	
79	Geminorum	6.3	+2.71	- 3.9	+20 30.9	8	7 27.0	- 5 2.2	+0.6762	0.5313	-0.1424	+90 + 7	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	α'	γ'	N. S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				
209 B. Geminorum	6.2	+2.69	4.3	+19 32.2	8 10 47.4	-1 48.1	+1.2766	0.5296	-0.1480	+82 +53
85 Geminorum	5.2	2.69	4.6	20 6.2	12 36.5	-0 2.4	+0.3775	0.5285	0.1509	+65 -10
217 B. Geminorum	6.3	2.69	4.9	20 2.6	15 8.6	+2 25.0	+0.0557	0.5272	0.1550	+45 -27
SATURN	-0.1	...	...	20 47.1	17 4.1	+4 16.9	-1.0702	0.5300	0.1589	-22 -69
10 H. Cancrī	6.1	2.67	5.1	19 4.6	17 7.4	+4 20.0	+0.8200	0.5262	0.1581	+90 +13
α^1 Cancrī	5.9	+2.63	6.2	+18 35.9	9 2 28.0	-10 36.5	-0.1914	0.5213	-0.1719	+31 -42
α^2 Cancrī	6.2	2.61	6.3	17 19.1	3 44.6	-9 22.2	+1.0090	0.5206	0.1737	+90 +24
NEPTUNE	7.7	...	...	19 3.4	5 30.5	-7 39.5	-1.2299	0.5210	0.1764	-37 -71
θ Cancrī	5.5	2.61	6.7	18 22.4	6 39.3	-6 32.7	-0.6747	0.5191	0.1776	+ 5 -71
54 Cancrī	6.3	2.53	7.5	15 39.4	16 42.5	+3 12.6	+0.4938	0.5141	0.1904	+73 - 9
α^1 Cancrī	5.1	+2.51	7.9	+15 38.4	19 56.8	+6 21.2	-0.1093	0.5126	-0.1941	+36 -41
α^2 Cancrī	5.7	2.52	7.9	15 53.9	20 7.2	+6 31.3	-0.4307	0.5125	0.1943	+18 -59
81 Cancrī	6.4	2.47	8.6	15 19.7	10 3 54.3	-9 55.2	-1.3429	0.5090	0.2027	-51 -72
ξ Leonis	5.1	2.36	9.0	11 39.9	14 25.9	+0 18.5	+0.5423	0.5047	-0.2125	+76 -10
σ Leonis	3.8	2.32	9.2	10 16.1	19 25.4	+5 9.5	+1.0232	0.5029	0.2166	+90 +18
83 B. Leonis	5.9	+2.26	9.7	+ 9 19.5	11 3 45.4	-10 44.4	+0.2399	0.5003	-0.2226	+55 -27
89 B. Leonis	6.2	2.25	9.6	8 42.5	4 41.2	-9 50.1	+0.7167	0.5001	0.2232	+90 - 2
π Leonis	4.9	2.24	9.7	8 26.4	5 50.1	-8 43.1	+0.7569	0.4997	0.2240	+90 + 1
43 Leonis	6.3	2.14	10.2	6 57.7	18 25.1	+3 31.1	-0.4680	0.4970	0.2309	+17 -68
155 B. Leonis	6.5	2.13	10.0	6 6.8	18 34.0	+3 39.8	+0.4380	0.4969	0.2309	+68 -18
35 Sextantis	6.1	+2.05	-10.4	+ 5 10.8	12 5 43.6	-9 29.0	-1.1330	0.4955	-0.2352	-23 -85
p^4 Leonis	5.7	1.93	10.4	2 24.2	18 52.4	+3 18.3	-1.1781	0.4954	0.2361	-26 -88
p^5 Leonis	5.3	1.89	10.0	0 22.8	22 40.4	+7 0.2	+0.1457	0.4956	0.2386	+50 -34
359 B. Leonis	6.3	1.85	10.2	+0 35.1	13 3 57.7	-11 51.2	-1.3419	0.4962	0.2388	-44 -85
388 B. Leonis	6.3	1.83	9.8	-1 14.7	6 30.6	-9 22.4	+0.0613	0.4965	0.2388	+45 -38
ϵ Leonis	5.1	+1.80	-9.4	-2 32.9	7 50.8	-8 4.4	+1.1716	0.4967	-0.2387	+87 +26
431 B. Leonis	6.2	1.78	9.7	1 58.8	12 18.2	-3 44.4	-0.5153	0.4975	0.2384	+15 -73
13 B. Virginis	5.9	1.71	9.0	4 52.4	19 13.7	+2 59.7	+1.0047	0.4993	0.2373	+85 +14
64 B. Virginis	6.5	1.62	8.5	7 18.9	14 5 44.9	-10 46.9	+1.1808	0.5028	0.2344	+83 +27
η Virginis	5.3	1.50	8.2	8 59.8	18 8.8	+1 15.8	+0.1290	0.5084	0.2288	+47 -35
370 B. Virginis	6.0	+1.41	-7.6	-11 12.1	15 4 48.0	+11 36.3	+0.1061	0.5145	-0.2219	+44 -36
69 Virginis	4.9	1.25	6.2	15 32.7	21 23.8	+3 41.8	+1.1885	0.5260	0.2073	+74 +30
75 Virginis	5.6	1.23	6.4	14 56.3	16 0 2.3	+6 15.3	-0.0036	0.5281	0.2044	+35 -42
83 Virginis	5.6	1.17	6.1	15 45.8	5 38.4	+11 40.7	-0.2521	0.5326	0.1979	+22 -56
85 Virginis	6.1	1.17	6.2	15 21.2	6 9.9	-11 48.8	-0.7922	0.5330	0.1973	- 8 -90
87 Virginis	5.8	+1.16	-5.5	-17 26.8	7 1.2	-10 59.2	+1.2609	0.5337	-0.1963	+73 +39
89 Virginis	5.1	1.15	5.4	17 43.4	8 11.3	-9 51.4	+1.3245	0.5347	0.1948	+72 +50
43 H. Virginis	5.5	1.03	5.4	17 48.9	20 3.6	+1 37.5	-0.7965	0.5452	0.1782	-10 -90
231 G. Virginis	6.4	1.02	5.3	18 12.1	20 48.7	+2 21.0	-0.5236	0.5459	0.1770	+ 5 -75
236 G. Virginis	5.7	1.02	5.2	18 20.0	21 31.7	+3 2.5	-0.5115	0.5465	0.1759	+ 5 -74
9 G. Libræ	6.5	+0.94	-4.6	-20 4.6	17 4 46.7	+10 2.6	+0.0852	0.5534	-0.1639	+35 -37
17 G. Libræ	6.4	0.89	4.3	20 49.6	9 45.1	-9 9.5	+0.0737	0.5581	0.1549	+33 -37
18 G. Libræ	6.1	0.89	4.3	20 58.7	10 12.2	-8 43.3	+0.1630	0.5585	0.1541	+38 -32
43 B. Libræ	5.7	0.85	4.3	21 2.6	14 34.7	-4 30.2	-0.4249	0.5627	0.1457	+ 6 -69
47 G. Libræ	6.1	0.80	4.0	21 42.6	18 26.4	-0 47.0	-0.2792	0.5664	0.1378	+13 -58
64 G. Libræ	5.8	+0.76	-3.8	-22 5.6	22 36.7	+3 14.1	-0.4383	0.5704	-0.1289	+ 4 -70
153 B. Libræ	6.3	0.69	3.1	24 12.6	18 5 30.4	+9 52.4	+0.9048	0.5768	0.1133	+66 +12
169 B. Libræ	6.0	0.67	3.5	22 52.1	7 25.0	+11 42.6	-0.6857	0.5785	0.1088	-12 -90
177 B. Libræ	6.2	0.66	3.5	22 52.8	8 2.9	-11 41.0	-0.7406	0.5791	0.1073	-15 -90
42 Libræ	5.0	0.66	3.3	23 33.0	8 24.8	-11 19.9	-0.0924	0.5794	0.1064	+19 -47
Δ Scorpii	4.6	+0.61	-2.8	-25 4.9	13 44.7	-6 12.3	+0.9414	0.5841	-0.0932	+65 +14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	s	d h m	h m					
31 B. Scorpii	5.4	+0.60	-3.1	24 17.3	18 13 52.2	-6 5.1	+0.1189	0.5842	-0.0929	+29	-35
32 B. Scorpii	5.3	0.60	3.2	23 43.9	13 53.4	-6 4.0	-0.4506	0.5842	0.0928	-1	-71
3 Scorpii	5.9	0.60	2.8	25 0.0	14 9.8	-5 48.3	+0.8191	0.5845	0.0921	+65	+6
40 B. Scorpii	5.4	0.59	3.0	24 35.6	15 43.5	-4 18.2	+0.2632	0.5858	0.0881	+36	-27
48 B. Scorpii	4.9	0.57	2.6	25 38.1	17 35.8	-2 30.3	+1.1652	0.5874	0.0832	+64	+35
50 B. Scorpii	6.4	+0.56	-3.0	24 29.9	17 50.0	-2 16.7	-0.0131	0.5876	-0.0826	+21	-42
57 B. Scorpii	5.7	0.56	3.3	23 22.9	18 42.7	-1 26.1	-1.2232	0.5883	0.0803	-55	-86
24 G. Scorpii	6.2	0.55	3.0	24 14.5	19 23.4	-0 47.0	-0.4006	0.5888	0.0785	0	-67
27 G. Scorpii	5.8	0.54	3.4	23 27.9	19 44.4	-0 26.9	-1.2181	0.5892	0.0775	-54	-86
41 G. Scorpii	6.3	0.53	3.0	24 12.7	21 41.8	+1 25.8	-0.6043	0.5907	0.0723	-11	-86
85 B. Scorpii	6.0	+0.52	-2.7	25 16.1	22 7.4	+1 50.4	+0.4388	0.5910	-0.0711	+45	-17
19 Scorpii	4.9	0.50	3.1	23 58.3	19 0 22.3	+4 0.0	-1.0309	0.5927	0.0649	-38	-90
σ Scorpii	3.1	0.50	2.7	25 23.7	0 34.0	+4 11.2	+0.4021	0.5929	0.0644	+43	-19
α Scorpii	1.2	0.47	2.4	26 15.0	3 43.5	+7 13.0	+1.0769	0.5952	0.0556	+64	+26
22 Scorpii	4.8	0.46	2.8	24 56.0	4 3.0	+7 31.7	-0.2731	0.5954	0.0547	+5	-58
116 B. Scorpii	6.2	+0.46	-2.4	26 21.5	4 28.9	+7 56.5	+1.1455	0.5957	-0.0534	+64	+34
126 B. Scorpii	6.1	0.42	2.9	24 18.5	8 25.0	+11 43.0	-1.1146	0.5984	0.0421	-47	-90
88 B. Ophiuchi	6.3	0.36	2.7	24 58.1	15 20.6	-5 38.6	-0.6677	0.6024	0.0216	-19	-90
26 Ophiuchi	5.8	0.36	2.7	24 51.8	15 25.0	-5 34.4	-0.7735	0.6025	0.0214	-25	-90
118 B. Ophiuchi	6.2	0.34	2.4	26 24.2	17 55.2	-3 10.5	+0.7274	0.6038	0.0138	+64	+1
137 B. Ophiuchi	6.3	+0.32	-2.6	25 9.3	19 56.1	-1 14.5	-0.5461	0.6047	-0.0076	-14	-80
36 Ophi. (1st star)	5.4	0.31	2.4	26 29.0	21 5.7	-0 7.8	+0.7780	0.6052	-0.0041	+64	+4
θ Ophiuchi	3.4	0.29	2.7	24 55.1	23 34.6	+2 14.8	-0.7882	0.6062	+0.0035	-27	-90
136 G. Ophiuchi	6.3	0.28	2.5	25 52.3	20 1 23.1	+3 58.7	+0.1761	0.6069	0.0091	+25	-31
151 G. Ophiuchi	6.0	0.26	2.4	26 12.5	3 9.8	+5 40.9	+0.5325	0.6075	0.0147	+47	-11
63 Ophiuchi	6.1	+0.20	-2.6	24 52.3	11 43.5	-10 7.2	-0.5570	0.6095	+0.0414	-11	-81
7 Sagittarii	5.5	0.18	2.7	24 17.0	14 39.4	-7 18.9	-1.0057	0.6099	0.0505	-38	-90
9 Sagittarii	6.0	0.18	-2.7	24 21.9	15 1.8	-6 57.3	-0.9062	0.6099	0.0517	-31	-90
NEW MOON.											
ρ Aquarii	5.3	+0.18	+0.1	8 14.3	24 20 2.6	-5 57.0	+1.3338	0.5593	+0.2586	+81	+44
170 B. Aquarii	6.0	0.19	0.2	7 36.9	21 30.7	-4 32.1	+1.0994	0.5585	0.2594	+82	+20
51 Aquarii	5.8	0.18	0.7	5 15.4	21 46.7	-4 16.6	-1.1554	0.5583	0.2595	-26	-90
186 B. Aquarii	6.1	0.21	0.5	6 58.7	25 0 55.8	-1 14.1	+1.3641	0.5566	0.2609	+78	+49
κ Aquarii	5.2	0.22	1.0	4 39.4	3 48.5	+1 32.5	-0.1774	0.5551	0.2620	+32	-51
207 B. Aquarii	6.3	+0.22	+1.2	-3 59.1	5 9.7	+2 50.9	-0.4857	0.5544	+0.2624	+16	-71
6 G. Piscium	6.2	0.28	1.8	2 50.4	12 59.1	+10 24.1	+0.4378	0.5508	0.2638	+67	-19
22 B. Piscium	6.4	0.36	2.9	0 9.8	26 0 27.6	-2 30.8	+0.8016	0.5465	0.2628	+90	+1
κ Piscium	4.9	0.37	3.2	+0 48.1	2 1.1	-1 0.5	+0.2459	0.5460	0.2625	+55	-29
9 Piscium	6.4	0.37	3.2	0 40.0	2 9.8	-0 52.0	+0.4186	0.5460	0.2624	+66	-20
16 Piscium	5.7	+0.40	+3.6	+1 38.6	6 21.9	+3 11.5	+0.5434	0.5447	+0.2611	+75	-13
19 Piscium	5.4	0.44	4.1	3 1.6	10 58.3	+7 38.7	+0.3524	0.5435	0.2590	+62	-23
36 Piscium	6.2	0.57	6.0	7 46.9	0 57.0	-2 50.3	-0.8862	0.5412	0.2501	-6	-82
d Piscium	5.4	0.59	6.0	7 43.9	2 49.4	-1 1.6	-0.3690	0.5410	0.2486	+22	-61
136 B. Piscium	6.5	0.69	6.7	8 54.2	12 24.7	+8 14.6	+0.7796	0.5405	0.2397	+90	+2
58 Piscium	5.7	+0.72	+7.6	+11 31.4	15 6.5	+10 51.1	-1.2581	0.5404	+0.2368	-35	-78
75 Piscium	6.3	0.82	8.1	12 30.8	28 0 11.4	-4 22.1	-0.1754	0.5408	0.2263	+32	-47
η Piscium	3.7	0.97	9.0	14 55.3	11 43.7	+6 47.2	-0.1429	0.5419	0.2107	+34	-43
101 Piscium	6.2	1.00	8.8	14 14.4	13 43.0	+8 42.6	+0.9810	0.5422	0.2078	+90	+19
105 Piscium	6.1	1.02	9.5	15 59.3	15 30.3	+10 26.3	-0.4678	0.5424	0.2051	+16	-61
3 Arietis	6.4	+1.06	+9.8	+17 0.0	18 40.9	-10 29.4	-0.8802	0.5429	+0.2002	-7	-73

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.		Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$								
4	Arietis	5.8	+1.08	+9.6	+16 32.7	28 19 25.1	-9 46.7	-0.2589	0.5430	+0.1991	+27	-48
1	Arietis	5.1	1.13	9.9	17 24.9	23 37.6	-5 42.6	-0.3455	0.5437	0.1922	+23	-52
35 B.	Arietis	6.4	1.18	10.0	17 51.5	29 2 32.5	-2 53.6	-0.2559	0.5442	0.1874	+28	-47
47 B.	Arietis	6.5	1.20	9.9	17 38.2	4 24.0	-1 5.8	+0.3208	0.5446	0.1843	+61	-16
20 H ¹ .	Arietis	6.4	1.21	9.5	16 50.3	5 8.4	0 22.9	+1.2960	0.5447	0.1829	+82	+51
15	Arietis	5.9	+1.22	+10.4	+19 6.7	5 41.4	+0 9.0	-0.9919	0.5448	+0.1820	-16	-71
9	Arietis	5.6	1.28	10.5	19 31.2	9 6.9	+3 27.5	-0.8106	0.5455	0.1760	-4	-70
26	Arietis	6.2	1.36	10.3	19 29.4	14 48.2	+8 57.3	+0.1920	0.5466	0.1656	+53	-21
μ	Arietis	5.7	1.44	10.2	19 39.7	20 7.1	-9 54.6	+0.8661	0.5477	0.1555	+90	+17
47	Arietis	5.8	1.55	10.2	20 20.4	30 3 11.6	-3 4.7	+1.2012	0.5491	0.1415	+90	+45
2	Arietis (mean)	4.6	+1.56	+10.4	+21 0.7	3 42.2	-2 35.1	+0.5575	0.5492	+0.1404	+80	+1
66	Arietis	6.1	1.77	10.2	22 31.3	16 46.6	+10 2.4	+0.8079	0.5516	0.1130	+86	+7
7	Tauri	5.9	1.82	10.6	24 11.4	19 25.8	-11 24.0	-0.8902	0.5520	0.1072	-11	-66
16	Tauri	5.4	1.89	10.2	24 1.9	31 0 2.5	-6 56.9	-0.2508	0.5526	0.0970	-27	-37
17	Tauri	3.8	1.89	10.2	23 51.4	0 4.5	-6 55.0	-0.0681	0.5527	0.0970	+38	-26
18	Tauri	5.6	+1.90	+10.4	+24 35.0	0 11.6	-6 48.2	-0.8289	0.5527	+0.0967	-7	-65
9	Tauri	4.3	1.90	10.3	24 12.6	0 13.1	-6 46.7	-0.4260	0.5527	0.0966	+18	-47
20	Tauri	4.1	1.90	10.2	24 6.7	0 29.7	-6 30.6	-0.2933	0.5527	0.0960	+25	-39
21	Tauri	5.8	1.90	10.3	24 18.0	0 31.7	-6 28.7	-0.4914	0.5526	0.0960	+14	-52
22	Tauri	6.5	1.90	10.2	24 16.4	0 35.4	-6 25.0	-0.4570	0.5528	0.0958	+16	-49
23	Tauri	4.3	+1.90	+10.0	+23 41.6	0 43.4	-6 17.4	+0.1793	0.5528	+0.0955	+52	-14
7	Tauri	3.0	1.91	10.1	23 51.1	1 14.1	-5 47.8	+0.0570	0.5528	0.0944	+45	-20
104 B.	Tauri	5.5	1.91	9.8	23 10.2	1 37.7	-5 25.0	+0.8289	0.5529	0.0935	+90	+21
27	Tauri	3.7	1.92	10.0	23 48.2	1 58.9	-5 4.6	+0.1795	0.5529	0.0927	+52	-14
28	Tauri	5.2	1.92	10.0	23 53.2	1 59.5	-5 4.0	+0.0905	0.5529	0.0927	+47	-18
36	Tauri	5.6	+2.02	+9.4	+23 52.9	8 43.5	+1 26.0	+0.6710	0.5537	+0.0774	+90	+14
1	Tauri	5.3	2.16	9.2	25 26.2	16 46.4	+9 12.1	-0.4646	0.5542	0.0589	+15	-47
62	Tauri	6.1	+2.15	+8.7	+24 6.7	17 25.2	+9 49.6	+1.0114	0.5542	+0.0574	+90	+37

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315 B. Tauri	6.3	+2.35	+7.3	+24 27.8	1 7 42.6	-0 22.8	+1.2161	0.5541	+0.0238	+85	+58
1 Tauri	5.6	2.37	7.3	24 55.5	8 32.5	+0 25.3	+0.7305	0.5541	+0.0219	+90	+22
118 Tauri	5.4	2.54	5.6	25 5.2	22 23.8	-10 12.2	+0.6355	0.5524	-0.0106	+90	+18
125 Tauri	5.1	2.61	5.2	25 51.2	2 3 4.1	-5 41.6	-0.2812	0.5515	0.0215	+24	-32
132 Tauri	5.0	+2.63	+4.3	+24 32.5	7 15.9	-1 38.5	+1.0496	0.5506	-0.0311	+90	+42
412 B. Tauri	5.8	2.66	3.7	24 14.4	10 50.7	+1 49.0	+1.2573	0.5497	0.0393	+76	+62
139 Tauri	4.7	2.70	4.1	25 56.7	11 17.7	+2 15.1	-0.6386	0.5496	0.0403	+5	-58
5 Geminorum	5.9	2.73	2.8	24 26.4	17 28.3	+8 13.1	+0.7284	0.5479	0.0541	+90	+19
8 Geminorum	6.1	2.74	2.4	23 59.9	19 39.6	+10 19.9	+1.0925	0.5472	0.0589	+90	+43
52 B. Geminorum	6.5	+2.84	+1.1	+24 39.7	3 5 22.2	-4 16.9	-0.3127	0.5439	-0.0798	+24	-39
8 Geminorum	3.2	2.87	0.8	25 12.9	8 22.0	-1 23.1	-1.1739	0.5427	0.0861	-36	-65
87 B. Geminorum	5.8	2.86	-0.1	23 42.0	12 9.6	+2 17.0	+0.1593	0.5412	0.0939	+51	-15
8 Geminorum	5.2	2.91	0.7	24 20.0	17 2.4	+7 0.2	-1.0249	0.5393	0.1036	-21	-66
44 Geminorum	5.9	2.88	1.2	22 45.7	18 25.9	+8 20.9	+0.5705	0.5387	0.1064	+82	+5
8 Geminorum	3.5	+2.91	-2.4	+22 8.1	4 1 29.6	-8 49.1	+0.4668	0.5356	-0.1199	+72	-2
58 Geminorum	6.0	2.94	2.5	23 6.3	3 4.8	+7 16.9	-0.8014	0.5349	0.1228	-4	-67
149 B. Geminorum	6.4	2.92	2.9	21 42.1	4 44.2	-5 40.7	+0.5496	0.5341	0.1258	+78	+2
63 Geminorum	5.3	2.92	3.0	21 36.9	5 9.6	-5 16.2	+0.5921	0.5339	0.1268	+83	+4
79 Geminorum	6.3	2.93	4.4	20 30.9	13 37.9	+2 56.1	+0.6776	0.5300	0.1415	+90	+7
209 B. Geminorum	6.2	+2.92	-5.0	+19 32.2	16 58.9	+6 10.8	+1.2803	0.5284	-0.1471	+81	+53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
SATURN	0.0	...	...	+21 15.0	4 18 45.7	+ 7 54.3	-0.8872	0.5311	-0.1508	- 9	-69
85 Geminorum	5.2	+2.94	5.2	20 6.2	18 48.3	+ 7 56.8	+0.3814	0.5276	0.1501	+65	-10
217 B. Geminorum	6.3	2.94	5.5	20 2.6	21 20.9	+10 24.7	+0.0606	0.5284	0.1542	+45	-27
10 H. Cancr	6.1	2.98	5.9	19 4.5	23 19.9	-11 40.0	+0.8267	0.5254	0.1573	+90	+14
d ¹ Cancr	5.9	2.94	7.2	18 35.9	5 8 41.4	- 2 35.5	-0.1801	0.5211	0.1712	+32	-42
d ² Cancr	6.2	+2.92	7.5	+17 19.1	9 58.1	- 1 21.2	+1.0220	0.5205	-0.1730	+90	+25
NEPTUNE	7.7	...	...	19 14.2	10 9.0	- 1 10.6	-1.1427	0.5217	0.1738	-28	-71
6 Cancr	5.5	2.94	7.8	18 22.4	12 53.0	+ 1 28.5	-0.6611	0.5192	0.1770	+ 5	-70
54 Cancr	6.3	2.90	9.2	15 39.4	22 56.0	+11 13.6	+0.5145	0.5147	0.1899	+75	- 8
e ¹ Cancr	5.1	2.90	9.6	15 38.4	6 2 10.1	- 9 38.0	-0.0865	0.5134	0.1937	+37	-39
o ² Cancr	5.7	+2.90	9.6	+15 53.9	2 20.5	- 9 27.9	-0.4080	0.5133	-0.1939	+20	-58
81 Cancr	6.4	2.89	10.5	15 19.7	10 6.8	- 1 55.1	-1.3149	0.5102	0.2024	-45	-75
5 Leonis	5.1	2.82	11.6	11 39.9	20 36.6	+ 8 16.7	+0.5783	0.5064	0.2125	+79	- 7
o Leonis	3.8	2.79	12.1	10 16.0	7 1 35.1	-10 53.3	+1.0631	0.5048	0.2166	+90	+21
83 B. Leonis	5.9	2.77	12.8	9 19.4	9 53.2	- 2 49.2	+0.2860	0.5024	0.2228	+58	-24
89 B. Leonis	6.2	+2.76	-12.8	+ 8 42.4	10 48.7	- 1 55.2	+0.7636	0.5022	-0.2234	+90	+ 1
π Leonis	4.9	2.75	12.9	8 26.4	11 57.3	- 0 48.5	+0.8047	0.5019	0.2242	+90	+ 3
43 Leonis	6.3	2.70	13.8	6 57.6	8 0 28.9	+11 22.4	-0 4107	0.4994	0.2312	+20	-64
155 B. Leonis	6.5	2.69	13.7	6 6.7	0 37.8	+11 31.0	+0.4957	0.4994	0.2313	+72	-15
35 Sextantis	6.1	2.64	14.4	5 10.8	11 44.5	- 1 40.6	-1.0676	0.4980	0.2356	-18	-85
p ⁴ Leonis	5.7	+2.57	-14.8	+ 2 24.1	9 0 50.2	+11 3.6	-1.1034	0.4976	-0.2385	-21	-88
p ⁵ Leonis	5.3	2.54	14.6	0 22.7	4 37.6	- 9 15.2	+0.2251	0.4978	0.2388	+54	-30
359 B. Leonis	6.3	2.52	14.9	+0 35.0	9 54.2	- 4 7.3	-1.2618	0.4982	0.2390	-34	-89
338 B. Leonis	6.3	2.50	14.7	-1 14.8	12 26.7	- 1 39.0	+0.1464	0.4984	0.2389	+49	-34
e Leonis	5.1	2.49	14.5	2 33.0	13 46.8	- 0 21.0	+1.2601	0.4986	0.2389	+87	+34
431 B. Leonis	6.2	+2.47	-14.8	- 1 58.9	18 14.0	+ 3 58.8	-0.4278	0.4993	-0.2384	+19	-67
13 B. Virginis	5.9	2.42	14.4	4 52.5	10 1 9.6	+10 43.0	+1.1016	0.5006	0.2372	+85	+20
64 B. Virginis	6.5	2.36	14.0	7 19.0	11 42.0	- 3 2.3	+1.2860	0.5035	0.2340	+83	+38
q Virginis	5.3	2.29	13.7	8 59.9	11 0 9.7	+ 9 4.1	+0.2367	0.5081	0.2280	+52	-29
370 B. Virginis	6.0	2.22	13.1	11 12.1	10 54.4	- 4 29.9	+0.2188	0.5131	0.2208	+50	-30
69 Virginis	4.9	+2.12	-11.6	-15 32.8	12 3 43.2	+11 48.6	+1.3174	0.5228	-0.2056	+74	+46
75 Virginis	5.6	2.09	11.8	14 56.4	6 24.4	- 9 35.1	+0.1149	0.5245	0.2027	+41	-35
83 Virginis	5.6	2.05	11.4	15 45.9	12 6.5	- 4 3.6	-0.1350	0.5284	0.1960	+28	-49
85 Virginis	6.1	2.05	11.5	15 21.2	12 38.6	- 3 32.5	-0.6807	0.5288	0.1954	- 1	-90
43 H. Virginis	5.5	1.94	10.3	17 49.0	13 2 50.5	+10 11.9	-0.6847	0.5392	0.1760	- 4	-90
231 G. Virginis	6.4	+1.94	-10.1	-18 12.2	3 36.7	+10 56.6	-0.4085	0.5398	-0.1748	+11	-67
236 G. Virginis	5.7	1.93	10.1	18 20.1	4 20.8	+11 39.2	-0.3962	0.5404	0.1737	+11	-66
9 G. Libræ	6.5	1.87	9.2	20 4.7	11 47.1	- 5 9.4	+0.2083	0.5463	0.1617	+41	-30
17 G. Libræ	6.4	1.83	8.7	20 49.6	16 54.0	- 0 12.9	+0.1964	0.5504	0.1527	+40	-31
18 G. Libræ	6.1	1.83	8.6	20 58.8	17 21.8	+ 0 14.0	+0.2869	0.5508	0.1519	+45	-26
43 B. Libræ	5.7	+1.79	-8.6	-21 2.7	21 52.2	+ 4 35.0	-0.3100	0.5545	-0.1435	+12	-60
47 G. Libræ	6.1	1.75	8.0	21 42.7	14 1 51.0	+ 8 25.3	-0.1628	0.5578	0.1357	+19	-51
64 G. Libræ	5.8	1.71	7.6	22 5.7	6 9.4	-11 25.5	-0.3252	0.5612	0.1269	+ 9	-61
153 B. Libræ	6.3	1.65	6.5	24 12.6	13 17.0	- 4 33.4	+1.0374	0.5669	0.1115	+66	+22
169 B. Libræ	6.0	1.62	6.9	22 52.1	15 15.6	- 2 39.1	-0.5791	0.5685	0.1070	- 6	-82
177 B. Libræ	6.2	+1.61	-6.8	-22 52.9	15 54.7	- 2 1.5	-0.6352	0.5690	-0.1055	- 9	-89
42 Libræ	5.0	1.62	6.6	23 33.1	16 17.4	- 1 39.6	+0.0234	0.5693	0.1046	+25	-40
A Scorpii	4.6	1.57	5.7	25 4.9	21 48.8	+ 3 39.4	+1.0726	0.5736	0.0917	+65	+25
31 B. Scorpii	5.4	1.56	6.0	24 17.3	21 56.5	+ 3 46.8	+0.2365	0.5737	0.0914	+35	-28
32 B. Scorpii	5.3	1.56	6.2	23 44.0	21 57.8	+ 3 48.0	-0.3425	0.5737	0.0913	+ 5	-63
3 Scorpii	5.9	+1.56	-5.7	-25 0.0	22 14.7	+ 4 4.4	+0.9482	0.5739	-0.0906	+65	+15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Υ	π	γ	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
40 B. Scorpii	5.4	+1.54	-5.8	24 35.7	14 23 51.9	+ 5 37.9	+0.3825	0.5751	-0.0867	+44	-20
50 B. Scorpii	6.4	1.52	5.7	24 30.0	15 2 3.0	+ 7 44.0	+0.1007	0.5767	0.0813	+27	-36
57 B. Scorpii	5.7	1.50	6.0	23 22.9	2 57.6	+ 8 36.8	-1.1300	0.5774	0.0790	-45	-90
24 G. Scorpii	6.2	1.50	5.7	24 14.5	3 39.9	+ 9 17.3	-0.2939	0.5779	0.0772	+ 6	-60
27 G. Scorpii	5.8	1.49	5.9	23 28.0	4 1.6	+ 9 38.2	-1.1252	0.5781	0.0763	-45	-90
41 G. Scorpii	6.3	+1.47	-5.6	24 12.7	6 3.3	+11 35.2	-0.5019	0.5795	-0.0712	- 5	-75
85 B. Scorpii	6.0	1.47	5.2	25 16.1	6 29.9	-11 59.2	+0.5587	0.5799	0.0700	+53	-10
19 Scorpii	4.9	1.44	5.5	23 58.3	8 49.9	- 9 44.7	-0.9370	0.5814	0.0640	-31	-90
σ Scorpii	3.1	1.44	4.9	25 23.8	9 2.0	- 9 33.0	+0.5203	0.5816	0.0635	+50	-12
α Scorpii	1.2	1.41	4.4	26 15.0	12 18.7	- 6 23.9	+1.2051	0.5837	0.0548	+64	+41
22 Scorpii	4.8	+1.40	-4.9	24 56.1	12 39.0	- 6 4.4	-0.1680	0.5839	-0.0539	+10	-52
116 B. Scorpii	6.2	1.41	4.4	26 21.5	13 5.8	- 5 38.6	+1.2745	0.5842	0.0527	+64	+59
126 B. Scorpii	6.1	1.34	4.8	24 18.6	17 10.9	- 1 43.2	-1.0262	0.5867	0.0417	-40	-90
88 B. Ophiuchi	6.3	1.26	4.2	24 58.1	16 0 22.5	+ 5 11.3	-0.5754	0.5906	0.0216	-14	-83
26 Ophiuchi	5.8	1.26	4.2	24 51.9	0 27.0	+ 5 15.6	-0.6830	0.5906	0.0214	-20	-90
118 B. Ophiuchi	6.2	+1.24	-3.5	-26 24.2	3 2.9	+ 7 45.2	+0.8420	0.5919	-0.0140	+64	+ 8
137 B. Ophiuchi	6.3	1.21	3.8	25 9.3	5 8.5	+ 9 45.7	-0.4544	0.5929	0.0080	- 9	-72
36 Ophi. (1st star)	5.4	1.20	3.4	26 29.0	6 20.7	+10 55.0	+0.8914	0.5934	-0.0046	+63	+12
θ Ophiuchi	3.4	1.16	3.7	24 55.1	8 55.3	-10 36.5	-0.7028	0.5944	+0.0029	-23	-90
136 G. Ophiuchi	6.3	1.15	3.2	25 52.3	10 47.9	- 8 48.5	+0.2764	0.5951	0.0084	+30	-26
151 G. Ophiuchi	6.0	+1.13	-3.0	-26 12.5	12 38.6	- 7 2.3	+0.6375	0.5957	+0.0138	+56	- 5
63 Ophiuchi	6.1	1.02	2.9	24 52.3	21 31.2	+ 1 28.5	-0.4759	0.5980	0.0399	- 7	-74
7 Sagittarii	5.5	0.98	2.9	24 17.0	17 0 33.4	+ 4 23.3	-0.9339	0.5986	0.0489	-33	-90
9 Sagittarii	6.0	0.98	2.9	24 21.9	0 56.7	+ 4 45.7	-0.8330	0.5986	0.0500	-26	-90
67 B. Sagittarii	6.4	0.93	2.2	25 38.3	6 33.7	+10 8.8	+0.7749	0.5991	0.0666	+64	+ 4
70 B. Sagittarii	6.4	+0.91	-2.3	-24 57.3	7 38.9	+11 11.4	+0.1628	0.5992	+0.0697	+29	-32
λ Sagittarii	2.9	0.89	2.1	25 28.2	10 5.6	-10 28.0	+0.8578	0.5993	0.0769	+65	+ 9
24 Sagittarii	5.7	0.86	2.3	24 5.8	12 21.8	- 8 17.4	-0.3358	0.5992	0.0834	+ 4	-62
117 B. Sagittarii	5.8	0.83	2.4	23 34.6	14 7.7	- 6 35.9	-0.7023	0.5992	0.0886	-15	-90
26 Sagittarii	6.1	0.82	2.2	23 54.7	15 23.8	- 5 22.9	-0.2526	0.5991	0.0922	+ 9	-57
126 B. Sagittarii	5.7	+0.82	-1.8	-25 5.8	16 30.6	- 4 18.8	+1.0338	0.5990	+0.0954	+65	+22
ν^1 Sagittarii	5.0	0.77	2.2	22 50.9	20 6.2	- 0 52.2	-0.8473	0.5986	0.1055	-22	-90
ν^2 Sagittarii	5.1	0.76	2.2	22 46.6	20 27.7	- 0 31.4	-0.8909	0.5985	0.1065	-24	-90
154 B. Sagittarii	5.9	0.76	2.0	23 16.9	20 47.9	- 0 12.1	-0.8420	0.5985	0.1075	+ 6	-63
168 B. Sagittarii	6.3	0.74	2.1	22 48.8	22 57.1	+ 1 51.9	-0.5691	0.5981	0.1135	- 6	-81
191 B. Sagittarii	6.5	+0.72	-1.8	-23 19.4	18 1 39.9	+ 4 28.0	+0.2555	0.5976	+0.1210	+39	-27
199 B. Sagittarii	6.4	0.70	2.1	21 47.9	3 6.7	+ 5 51.2	-1.0817	0.5972	0.1249	-37	-90
222 B. Sagittarii	5.5	0.68	1.7	22 33.5	6 14.4	+ 8 51.2	+0.0780	0.5965	0.1333	+30	-37
50 Sagittarii	5.5	0.65	1.8	21 56.5	8 26.1	+10 57.6	-0.2338	0.5958	0.1391	+15	-55
253 B. Sagittarii	6.1	0.64	1.8	21 29.2	10 12.6	-11 20.2	-0.4344	0.5953	0.1437	+ 5	-69
f Sagittarii	5.1	+0.58	-1.8	-19 57.7	16 13.7	- 5 33.6	-1.0293	0.5933	+0.1588	-29	-90
σ Capricorni	5.5	0.49	-1.3	-19 22.7	19 5 12.4	+ 6 54.0	+0.6566	0.5878	0.1887	+69	- 6
NEW MOON.											
36 Piscium	6.2	+0.38	+4.1	+ 7 46.8	23 11 2.3	+ 9 3.0	-0.9921	0.5513	+0.2535	-13	-82
d Piscium	5.4	+0.40	+4.1	+ 7 43.8	12 51.1	+10 48.1	-0.4843	0.5512	+0.2521	+16	-69
136 B. Piscium	6.5	0.46	4.7	8 54.2	22 7.4	- 4 14.7	+0.6365	0.5511	0.2432	-84	- 6
75 Piscium	6.3	0.54	6.0	12 30.8	24 9 30.1	+ 6 44.7	-0.3158	0.5516	0.2298	+24	-55
η Piscium	3.7	0.65	6.8	14 55.2	20 38.6	- 6 29.8	-0.2936	0.5526	0.2140	+26	-52
101 Piscium	6.2	0.67	6.7	14 14.4	22 33.9	- 4 38.5	+0.8110	0.5528	0.2110	+90	+ 8
105 Piscium	6.1	+0.69	+7.2	+15 59.2	25 0 17.5	- 2 58.6	-0.6162	0.5530	+0.2083	+ 8	-70

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	z'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	° ' "	d h m	h m				° ' "			
3 Arietis	6.4	+0.72	+7.6	+17 0.0	25 3 21.7	- 0 0.7	-1.0244	0.5533	+0.2033	-17-73			
4 Arietis	5.8	0.73	7.4	16 32.7	4 4.4	+ 0 40.5	-0.4133	0.5534	0.2021	+19-57			
5 Arietis	5.1	0.78	7.8	17 24.9	8 8.5	+ 4 36.1	-0.5012	0.5540	0.1952	+14-62			
35 B. Arietis	6.4	0.81	7.9	17 51.4	10 57.6	+ 7 19.3	-0.4148	0.5543	0.1903	+19-56			
47 B. Arietis	6.5	0.83	7.9	17 38.2	12 45.4	+ 9 3.4	+0.1516	0.5546	0.1870	+50-25			
20 H ¹ . Arietis	6.4	+0.84	+7.6	+16 50.3	13 28.5	+ 9 45.0	+1.1116	0.5547	+0.1857	+90+31			
15 Arietis	5.9	0.85	8.3	19 6.7	14 0.4	+10 15.8	-1.1411	0.5548	0.1847	-28-71			
9 Arietis	5.6	0.89	8.4	19 31.2	17 19.2	-10 32.4	-0.9646	0.5552	0.1788	-14-70			
26 Arietis	6.2	0.96	8.4	19 29.4	22 49.9	- 5 13.2	+0.0202	0.5560	0.1680	+42-30			
μ Arietis	5.7	1.03	8.5	19 39.7	26 3 59.2	- 0 14.8	+0.6825	0.5566	0.1577	+90+6			
47 Arietis	5.8	+1.13	+8.5	+20 20.3	10 51.5	+ 6 22.9	+1.0112	0.5575	+0.1433	+90+29			
8 Arietis (<i>mean</i>)	4.6	1.14	8.8	21 0.7	11 21.2	+ 6 51.6	+0.3766	0.5575	0.1423	+65-8			
66 Arietis	6.1	1.33	8.8	22 31.3	27 0 5.2	- 4 51.4	+0.4246	0.5586	0.1143	+69-3			
7 Tauri	5.9	1.38	9.3	24 11.4	2 40.6	- 2 21.5	-1.0547	0.5588	0.1085	-23-66			
16 Tauri	5.4	1.45	9.1	24 1.9	7 11.0	+ 1 59.3	-0.4237	0.5590	0.0981	-18-47			
17 Tauri	3.8	+1.45	+9.0	+23 51.3	7 13.0	+ 2 1.2	-0.2333	0.5590	+0.0981	+23-36			
18 Tauri	5.6	1.45	9.2	24 34.9	7 19.9	+ 2 7.9	-0.9947	0.5590	0.0978	-19-65			
9 Tauri	4.3	1.45	9.1	24 12.6	7 21.4	+ 2 9.3	-0.5068	0.5590	0.0977	+8-59			
20 Tauri	4.1	1.45	9.1	24 6.7	7 37.6	+ 2 25.0	-0.4657	0.5590	0.0971	+15-50			
21 Tauri	5.8	1.46	9.1	24 17.9	7 39.6	+ 2 26.9	-0.6614	0.5590	0.0970	+4-63			
22 Tauri	6.5	+1.46	+9.1	+24 16.3	7 43.3	+ 2 30.5	-0.6274	0.5590	+0.0969	+6-61			
23 Tauri	4.3	1.46	8.9	23 41.6	7 51.0	+ 2 37.9	+0.0012	0.5590	0.0966	+41-23			
7 Tauri	3.0	1.46	8.9	23 51.1	8 21.1	+ 3 6.9	-0.1195	0.5590	0.0954	+35-30			
104 B. Tauri	5.5	1.46	8.7	23 10.2	8 44.1	+ 3 29.0	+0.6431	0.5591	0.0945	+90+11			
27 Tauri	3.7	1.47	8.9	23 48.2	9 4.9	+ 3 49.2	+0.0014	0.5591	0.0937	+42-23			
28 Tauri	5.2	+1.47	+8.9	+23 53.2	9 5.4	+ 3 49.6	-0.0866	0.5591	+0.0937	+36-28			
33 Tauri	6.0	1.52	8.4	22 56.3	12 31.8	+ 7 8.7	+1.2339	0.5591	0.0857	+84+55			
36 Tauri	5.6	1.58	8.5	23 52.8	15 41.3	+10 11.5	+0.4879	0.5591	0.0783	+74+4			
χ Tauri	5.3	1.72	8.5	25 26.2	23 35.3	- 6 11.4	-0.6347	0.5587	0.0595	+5-58			
62 Tauri	6.1	1.71	8.0	24 6.6	28 0 13.5	- 5 34.6	+0.8266	0.5587	0.0580	+90+25			
315 B. Tauri	6.3	+1.93	+6.9	+24 27.7	14 18.5	+ 8 0.6	+1.0343	0.5570	+0.0243	+90+42			
k Tauri	5.6	+1.95	+7.0	+24 55.5	15 7.8	+ 8 48.1	+0.5532	0.5568	+0.0224	+81+13			

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118 Tauri	5.4	+2.15	+5.7	+25 5.2	1 4 50.7	-	1 57.8	+0.4652	0.5539	-0.0101	+73+9		
125 Tauri	5.1	2.22	5.4	25 51.2	9 29.0	+	2 30.9	-0.4434	0.5526	0.0209	+16-42		
132 Tauri	5.0	2.26	4.5	24 32.5	13 39.2	+	6 32.3	+0.8818	0.5513	0.0305	+90+31		
412 B. Tauri	5.8	2.30	4.0	24 14.4	17 12.9	+	9 58.7	+1.0909	0.5502	0.0386	+90+45		
139 Tauri	4.7	2.34	4.5	25 56.8	17 39.7	+	10 24.6	-0.7947	0.5500	0.0396	-5-64		
5 Geminorum	5.9	+2.39	+3.2	+24 26.4	23 48.7	-	7 39.0	+0.5693	0.5478	-0.0533	+82+10		
8 Geminorum	6.1	2.41	2.8	23 59.9	2 159.6	-	5 32.6	+0.9333	0.5470	0.0581	+90+32		
9 Geminorum	6.2	2.41	2.7	23 46.2	2 17.9	-	5 14.9	+1.1658	0.5469	0.0588	+90+50		
52 B. Geminorum	6.5	2.54	1.7	24 39.7	11 41.0	+	3 49.3	-0.4590	0.5432	0.0788	+16-48		
87 B. Geminorum	5.8	2.59	+0.5	23 42.1	18 28.2	+	10 23.0	+0.0169	0.5402	0.0927	+42-23		
6 Geminorum	5.2	+2.65	0.0	+24 20.1	23 21.0	-	8 53.8	-1.1599	0.5380	-0.1024	-34-66		
44 Geminorum	5.9	2.64	-0.6	22 45.8	3 0 44.7	-	7 32.8	+0.4325	0.5374	0.1051	+70-2		
8 Geminorum	3.5	2.69	1.8	22 8.1	7 48.7	-	0 42.4	+0.3361	0.5343	0.1184	+62-9		
58 Geminorum	6.0	2.72	1.8	23 6.3	9 24.1	+	0 49.9	-0.9278	0.5334	0.1213	-13-67		
149 B. Geminorum	6.4	2.71	2.4	21 42.1	11 3.6	+	2 26.2	+0.4221	0.5326	0.1244	+68-5		
63 Geminorum	5.3	+2.72	-2.4	+21 36.9	11 29.1	+	2 50.9	+0.4649	0.5324	-0.1251	-72-3		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		$^{\circ}$	$'$	$^{\circ}$	d h m	h m				$^{\circ}$	$'$
79 Geminorum	6.3	+2.76	-3.9	+20 30.9	3 19 58.2	+11 4.0	+0.5598	0.5284	-0.1398	+80	+1
SATURN	0.1	...	...	21 34.5	21 49.4	-11 8.3	-0.8772	0.5295	0.1434	-9	-68
209 B. Geminorum	6.2	2.77	4.6	19 32.2	23 19.7	-9 40.9	+1.1656	0.5270	0.1454	+90	+40
85 Geminorum	5.2	2.80	4.7	20 6.2	4 1 9.3	-7 54.7	+0.2702	0.5281	0.1484	+57	-15
217 B. Geminorum	6.3	2.81	5.1	20 2.6	3 42.2	-5 26.5	-0.0471	0.5249	0.1524	+39	-32
10 H. Cancrī	6.1	+2.81	-5.6	+19 4.6	5 41.4	-3 31.0	+0.7206	0.5240	-0.1555	+90	+7
d ¹ Cancrī	5.9	2.86	6.9	18 35.9	15 4.1	+5 34.6	-0.2728	0.5198	0.1694	+26	-47
NEPTUNE	7.7	...	...	19 23.6	15 9.8	+5 40.2	-1.1727	0.5207	0.1698	-31	-71
d ² Cancrī	6.2	2.84	7.4	17 19.1	16 20.9	+6 49.1	+0.9298	0.5193	0.1712	+90	+18
θ Cancrī	5.5	2.88	7.5	18 22.4	19 16.1	+9 39.1	-0.7475	0.5180	0.1752	0	-72
54 Cancrī	6.3	+2.88	-9.3	+15 39.4	5 5 19.8	-4 35.1	+0.4417	0.5139	-0.1880	+69	-11
o ¹ Cancrī	5.1	2.90	9.7	15 38.3	8 34.1	-1 26.6	-0.1537	0.5127	0.1919	+33	-43
o ² Cancrī	5.7	2.90	9.7	15 53.9	8 44.5	-1 16.5	-0.4747	0.5126	0.1921	+16	-62
ξ Leonis	5.1	2.90	12.5	11 39.9	6 3 0.1	-7 32.3	+0.5406	0.5066	0.2108	+76	-10
o Leonis	3.8	2.90	13.1	10 16.0	7 58.0	-2 42.9	+1.0334	0.5053	0.2151	+90	+19
83 B. Leonis	5.9	+2.90	-14.0	+9 19.4	16 14.6	+5 19.8	+0.2721	0.5034	-0.2214	+57	-25
89 B. Leonis	6.2	2.90	14.1	8 42.4	17 10.0	+6 13.6	+0.7506	0.5032	0.2220	+90	+1
π Leonis	4.9	2.90	14.3	8 26.3	18 18.3	+7 20.0	+0.7938	0.5030	0.2228	+90	+3
43 Leonis	6.3	2.90	15.5	6 57.6	7 6 46.5	-4 32.6	-0.3962	0.5011	0.2301	+21	-62
155 B. Leonis	6.5	2.89	15.6	6 6.7	6 55.3	-4 24.1	+0.5088	0.5011	0.2302	+73	-14
35 Sextantis	6.1	+2.90	-16.4	+5 10.7	17 57.9	+6 20.2	-1.0301	0.5003	-0.2348	-16	-85
p ⁴ Leonis	5.7	2.88	17.3	2 24.1	6 57.6	+5 1.5	-1.0405	0.5006	0.2380	-16	-88
p ⁵ Leonis	5.3	2.86	17.5	0 22.6	10 43.0	-1 22.3	+0.2921	0.5009	0.2384	+58	-26
359 B. Leonis	6.3	2.86	17.7	+0 35.0	15 56.8	+3 42.8	-1.1810	0.5015	0.2387	-27	-89
388 B. Leonis	6.3	2.86	17.8	-1 14.9	18 28.0	+6 9.8	+0.2283	0.5019	0.2387	+54	-29
e Leonis	5.1	+2.85	-17.8	-2 33.0	19 47.3	+7 26.9	+1.3418	0.5021	-0.2386	+84	+44
431 B. Leonis	6.2	2.85	18.0	1 58.9	9 0 12.0	+11 44.2	-0.3338	0.5029	0.2383	+24	-60
13 B. Virginis	5.9	2.83	18.0	4 52.6	7 3.6	-5 35.6	+1.2047	0.5044	0.2371	+85	+29
78 B. Virginis	6.5	2.82	18.2	5 15.8	19 31.9	+6 31.4	-1.3092	0.5081	0.2332	-42	-88
q Virginis	5.3	2.80	17.8	9 0.0	10 5 50.6	-7 27.5	+0.3812	0.5120	0.2280	+61	-21
370 B. Virginis	6.0	+2.78	-17.4	-11 12.2	16 30.0	+2 53.1	+0.3798	0.5168	-0.2207	+60	-21
75 Virginis	5.6	2.74	16.2	14 56.4	11 11 53.0	-2 19.3	+0.3020	0.5274	0.2024	+52	-25
83 Virginis	5.6	2.73	15.8	15 46.0	17 34.0	+3 11.1	+0.0583	0.5309	0.1956	+38	-38
85 Virginis	6.1	2.72	15.9	15 21.3	18 6.0	+3 42.1	-0.4875	0.5312	0.1950	+9	-72
43 H. Virginis	5.5	2.68	14.5	17 49.1	12 8 17.6	-6 33.7	-0.4788	0.5405	0.1752	+7	-72
231 G. Virginis	6.4	+2.68	-14.4	-18 12.2	9 3.9	-5 48.9	-0.2012	0.5410	-0.1741	+21	-53
236 G. Virginis	5.7	2.68	14.3	18 20.1	9 48.0	-5 6.3	-0.1882	0.5415	0.1729	+22	-52
9 G. Libræ	6.5	2.65	13.2	20 4.8	17 15.8	+2 6.6	+0.4241	0.5467	0.1608	+54	-18
17 G. Libræ	6.4	2.63	12.7	20 49.7	22 24.4	+7 4.8	+0.4158	0.5503	0.1517	+52	-18
18 G. Libræ	6.1	2.63	12.6	20 58.9	22 52.4	+7 31.9	+0.5070	0.5506	0.1509	+58	-13
43 B. Libræ	5.7	+2.61	-12.6	-21 2.8	13 3 24.8	+11 54.9	-0.0902	0.5538	-0.1424	+23	-46
47 G. Libræ	6.1	2.58	11.7	21 42.8	7 25.8	-8 12.5	+0.0597	0.5566	0.1346	+30	-38
64 G. Libræ	5.8	2.55	11.2	22 5.8	11 46.9	-4 0.6	-0.1019	0.5595	0.1258	+21	-47
153 B. Libræ	6.3	2.53	9.8	24 12.7	19 0.0	+2 57.0	+1.2737	0.5643	0.1104	+66	+52
169 B. Libræ	6.0	2.49	10.1	22 52.2	21 0.3	+4 52.9	-0.3552	0.5656	0.1059	+6	-63
177 B. Libræ	6.2	+2.49	-10.0	-22 52.9	21 40.1	+5 31.4	-0.4116	0.5660	-0.1044	+2	-68
42 Libræ	5.0	2.49	9.7	23 33.1	22 3.2	+5 53.6	+0.2526	0.5663	0.1036	+38	-27
31 B. Scorpī	5.4	2.45	8.9	24 17.4	13 47.8	+11 25.5	+0.4688	0.5698	0.0903	+49	-15
32 B. Scorpī	5.3	2.44	9.1	23 44.0	3 49.1	+11 26.8	-0.1154	0.5699	0.0902	+17	-48
3 Scorpī	5.9	2.46	8.6	25 0.1	4 6.4	+11 43.5	+1.1872	0.5700	0.0896	+65	+38
40 B. Scorpī	5.4	+2.44	-8.6	-24 35.7	5 45.3	-10 41.3	+0.6166	0.5710	-0.0857	+59	-6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		$^{\circ}$	$''$	$^{\circ}$	d	h	m	h	m	$^{\circ}$	$''$	
50 B. Scorpii	6.4	+2.42	-8.4	24 30.0	14	7	58.9	-8 32.7	+0.3325	0.5723	-0.0803	+40 -23
57 B. Scorpii	5.7	2.39	8.6	23 23.0		8	54.6	-7 39.0	-0.9104	0.5729	0.0780	-29 -90
24 G. Scorpii	6.2	2.40	8.3	24 14.6		9	37.7	-6 57.5	-0.0659	0.5732	0.0763	+18 -45
27 G. Scorpii	5.8	2.38	8.5	23 28.0		9	59.9	-6 36.2	-0.9057	0.5735	0.0754	-28 -90
41 G. Scorpii	6.3	2.38	8.0	24 12.8		12	4.1	-4 36.6	-0.2761	0.5746	0.0703	+7 -58
85 B. Scorpii	6.0	+2.39	-7.6	25 16.1		12	31.2	-4 10.5	+0.7956	0.5749	-0.0691	+65 +5
19 Scorpii	4.9	2.34	7.8	23 58.3		14	54.2	-1 53.0	-0.7160	0.5761	0.0632	-18 -90
σ Scorpii	3.1	2.36	7.3	25 23.8		15	6.6	-1 41.0	+0.7571	0.5762	0.0627	+65 +3
22 Scorpii	4.8	2.32	7.0	24 56.1		18	48.5	-1 52.5	+0.0611	0.5781	0.0532	+22 -38
126 B. Scorpii	6.1	2.26	6.7	24 18.6		23	27.1	-6 20.5	-0.8078	0.5803	0.0411	-26 -90
88 B. Ophiuchi	6.3	+2.19	-5.6	24 58.1	15	6	50.1	-10 33.6	-0.3534	0.5832	-0.0214	-2 -64
26 Ophiuchi	5.8	2.18	5.7	24 51.9		6	54.7	-10 29.2	-0.4625	0.5833	0.0212	-8 -72
118 B. Ophiuchi	6.2	2.18	4.8	26 24.2		9	35.0	-7 55.1	+1.0820	0.5842	0.0139	+64 +28
137 B. Ophiuchi	6.3	2.14	5.0	25 9.3		11	44.2	-5 51.0	-0.2324	0.5849	0.0081	+3 -55
36 Oph. (1st star)	5.4	2.14	4.6	26 29.0		12	58.6	-4 39.6	+1.1315	0.5852	0.0047	+64 +33
39 Ophiuchi	5.1	+2.09	-5.1	24 11.9		14	3.2	-3 37.4	-1.2300	0.5856	-0.0017	-61 -83
θ Ophiuchi	3.4	2.08	4.6	24 55.1		15	37.8	-2 6.4	-0.4858	0.5860	+0.0026	-11 -74
191 B. Ophiuchi	6.3	2.06	4.8	24 10.2		16	52.1	-0 55.1	-1.2521	0.5863	0.0061	-63 -77
136 G. Ophiuchi	6.3	2.08	4.1	25 52.3		17	33.9	-0 14.9	+0.5066	0.5865	0.0080	+45 -12
151 G. Ophiuchi	6.0	2.06	3.7	26 12.5		19	28.1	-1 34.8	+0.8721	0.5869	0.0132	+64 +11
63 Ophiuchi	6.1	+1.92	-3.2	24 52.4	16	4	38.2	+10 23.2	-0.2622	0.5884	+0.0388	+4 -57
4 Sagittarii	4.8	1.88	3.3	23 48.6		6	34.8	-11 44.9	-1.2687	0.5885	0.0442	-64 -73
7 Sagittarii	5.5	1.88	3.0	24 17.0		7	46.6	-10 35.9	-0.7293	0.5886	0.0475	-20 -90
9 Sagittarii	6.0	1.87	3.0	24 21.9		8	10.7	-10 12.8	-0.6271	0.5887	0.0486	-14 -89
1 Sagittarii	5.2	1.82	2.8	23 43.2		11	16.7	-7 14.1	-1.1204	0.5888	0.0572	-46 -90
67 B. Sagittarii	6.4	+1.82	-1.9	25 38.2		13	59.6	-4 37.7	+1.0026	0.5888	+0.0647	+64 +20
70 B. Sagittarii	6.4	1.79	2.0	24 57.2		15	7.1	-3 32.8	+0.3799	0.5887	0.0678	+42 -20
λ Sagittarii	2.9	1.76	1.5	25 28.2		17	39.2	-1 6.9	+1.0845	0.5887	0.0747	+65 +27
24 Sagittarii	5.7	1.72	1.7	24 5.7		20	0.3	+1 8.7	-0.1306	0.5885	0.0811	+15 -49
117 B. Sagittarii	5.8	1.69	1.7	23 34.6		21	50.1	+2 54.2	-0.5048	0.5883	0.0861	-4 -74
26 Sagittarii	6.1	+1.67	-1.5	23 54.7		23	9.0	+4 10.0	-0.0487	0.5882	+0.0896	+20 -44
126 B. Sagittarii	5.7	1.67	0.9	25 5.7	17	0	18.3	+5 16.5	+1.2583	0.5881	0.0927	+65 +50
γ^1 Sagittarii	5.0	1.60	1.3	22 50.9		4	2.0	+8 51.5	-0.6579	0.5876	0.1026	-11 -90
γ^2 Sagittarii	5.1	1.59	1.3	22 46.6		4	24.3	+9 12.9	-0.6924	0.5874	0.1036	-13 -90
154 B. Sagittarii	5.9	1.59	1.1	23 16.8		4	45.3	+9 33.1	-0.1447	0.5874	0.1045	+16 -50
168 B. Sagittarii	6.3	+1.56	-1.0	22 48.8		6	59.3	+11 41.7	-0.3778	0.5870	+0.1103	+5 -65
σ Sagittarii	3.9	1.53	1.2	21 51.9		8	12.7	-11 7.7	-1.2010	0.5868	0.1135	-49 -90
191 B. Sagittarii	6.5	1.53	0.6	23 19.3		9	48.3	-9 35.9	+0.4580	0.5864	0.1176	+51 -16
199 B. Sagittarii	6.4	1.49	1.0	21 47.8		11	18.4	-8 9.1	-0.9036	0.5861	0.1214	-24 -90
222 B. Sagittarii	5.5	1.46	0.4	22 33.5		14	33.2	-5 2.1	+0.2723	0.5852	0.1296	+41 -26
50 Sagittarii	5.5	+1.42	-0.4	21 56.5		16	49.9	-2 50.7	-0.0474	0.5847	+0.1352	+24 -44
253 B. Sagittarii	6.1	1.40	0.4	21 29.2		18	40.5	-1 4.4	-0.2537	0.5841	0.1397	+14 -56
f Sagittarii	5.1	1.30	0.3	19 57.7	18	0	55.2	+4 55.8	-0.8666	0.5822	0.1545	-18 -90
57 Sagittarii	6.0	1.27	-0.3	19 15.4		3	17.1	+7 12.1	-1.2019	0.5814	0.1599	-44 -90
σ Capricorni	5.5	1.14	+0.7	19 22.7		14	22.4	+6 7.9	+0.8277	0.5774	0.1836	+71 +5
π Capricorni	5.2	+1.10	+0.7	-18 29.1		17	39.0	-2 58.8	+0.5462	0.5761	+0.1902	+63 -12
ρ Capricorni	5.0	1.09	0.6	18 5.3		18	17.5	-2 21.7	+0.2735	0.5758	0.1914	+47 -26
σ Capricorni	5.6	1.09	0.9	18 51.5		18	42.6	-1 57.6	+1.1221	0.5757	0.1922	+71 +26
47 B. Capricorni	6.2	1.05	0.5	16 48.7		21	4.0	+0 18.5	-0.4621	0.5748	0.1967	+9 -70
61 B. Capricorni	5.9	1.02	0.6	16 25.2		23	9.4	+2 19.3	-0.4372	0.5739	0.2005	+10 -69
94 B. Capricorni	5.7	+0.95	+1.0	-16 21.1	19	6	19.3	+9 13.1	-0.9756	0.5711	+0.2129	+74 +14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0. $\Delta\alpha$ $\Delta\delta$	Apparent Declina- tion. δ ϵ η	Greenwich Mean Time. d h m	Hour Angle, H h m	Y	x'	y'	N.	S.
95 B. Capricorni	5.9	+0.93	+0.7	-14 48.2	19 6 46.3	+ 9 39.1	-0.4675	0.5709	+0.2136	+10 -70
53 B. Aquarii	6.5	0.86	0.9	13 32.8	14 5.9	- 7 17.5	-0.1094	0.5681	0.2249	+31 -47
18 Aquarii	5.5	0.82	1.1	13 14.1	17 35.5	- 3 55.5	+0.3752	0.5668	0.2297	+58 -21
72 B. Aquarii	6.5	0.80	0.9	11 55.7	19 20.0	- 2 14.7	-0.5188	0.5661	0.2320	+10 -74
137 B. Capricorni	6.2	0.75	1.0	10 57.0	20 0 10.3	+ 2 25.1	-0.3506	0.5644	0.2380	+20 -62
c^1 Capricorni	5.3	+0.72	+0.8	- 9 27.8	2 34.4	+ 4 44.0	-1.2485	0.5636	+0.2408	-37 -90
c^2 Capricorni	6.3	0.72	0.9	9 39.6	3 7.2	+ 5 15.6	-0.9231	0.5634	0.2413	-12 -90
λ Capricorni	5.5	0.74	1.3	11 44.9	3 13.0	+ 5 21.2	+1.1705	0.5634	0.2414	+78 +28
96 B. Aquarii	6.5	0.71	1.3	-10 42.2	6 17.3	+ 8 18.9	+0.8805	0.5624	0.2447	+79 + 7
NEW MOON.										
ϵ Arietis	5.1	+0.56	+5.8	+17 24.9	24 18 12.9	- 7 31.3	-0.6769	0.5621	+0.1962	+ 4 -72
35 B. Arietis	6.4	0.58	6.0	17 51.4	20 58.2	- 4 52.0	-0.5961	0.5626	0.1913	+ 9 -67
47 B. Arietis	6.5	0.59	6.0	17 38.2	22 43.5	- 3 10.4	-0.0380	0.5630	0.1880	+39 -35
20 H. Arietis	6.4	0.60	5.8	16 50.2	23 25.5	- 2 29.9	+0.9113	0.5632	0.1868	+80 +17
15 Arietis	5.9	+0.60	+6.2	+19 6.7	23 56.7	- 1 59.8	-1.3202	0.5632	+0.1858	-53 -70
θ Arietis	5.6	0.62	6.4	19 31.2	25 3 10.8	+ 1 7.3	-1.1504	0.5639	0.1796	-29 -70
26 Arietis	6.2	0.66	6.4	19 29.4	8 33.3	+ 6 18.2	-0.1842	0.5648	0.1690	+31 -40
μ Arietis	5.7	0.72	6.5	19 39.6	13 34.8	+11 8.7	+0.4634	0.5656	0.1587	+71 - 5
47 Arietis	5.8	0.79	6.7	20 20.3	20 16.5	- 6 24.0	+0.7790	0.5666	0.1443	+90 +14
ϵ Arietis (mean)	4.6	+0.79	+6.8	+21 0.7	20 45.4	- 5 56.2	+0.1509	0.5666	+0.1433	+50 -20
66 Arietis	6.1	0.94	7.1	22 31.2	26 9 9.6	+ 6 0.9	+0.1834	0.5677	0.1150	+52 -15
7 Tauri	5.9	0.97	7.5	24 11.3	11 40.9	+ 8 26.7	-1.2810	0.5678	0.1091	-54 -66
16 Tauri	5.4	1.02	7.3	24 1.9	16 4.4	-11 19.5	-0.6619	0.5679	0.0987	+ 4 -63
17 Tauri	3.8	1.02	7.3	23 51.3	16 6.3	-11 17.7	-0.4738	0.5679	0.0986	+15 -50
18 Tauri	5.6	+1.03	+7.5	+24 34.9	16 13.0	-11 11.1	-1.2263	0.5679	+0.0984	-43 -65
q Tauri	4.3	1.03	7.4	24 12.6	16 14.5	-11 9.7	-0.8331	0.5679	0.0983	- 7 -66
20 Tauri	4.1	1.03	7.3	24 6.7	16 30.3	-10 54.5	-0.7038	0.5679	0.0977	+ 1 -65
21 Tauri	5.8	1.03	7.4	24 17.9	16 32.2	-10 52.7	-0.8972	0.5679	0.0976	-12 -66
22 Tauri	6.5	1.03	7.4	24 16.3	16 35.8	-10 49.2	-0.8636	0.5679	0.0975	- 9 -66
23 Tauri	4.3	+1.03	+7.2	+23 41.6	16 43.3	-10 42.0	-0.2426	0.5679	+0.0972	+27 -36
η Tauri	3.0	1.04	7.2	23 51.1	17 12.6	-10 13.8	-0.3624	0.5679	0.0960	+21 -43
104 B. Tauri	5.5	1.04	7.0	23 10.1	17 35.1	- 9 52.0	+0.3908	0.5679	0.0951	+66 - 3
27 Tauri	3.7	1.05	7.2	23 48.2	17 55.3	- 9 32.6	-0.2435	0.5678	0.0943	+27 -36
28 Tauri	5.2	1.05	7.2	23 53.2	17 55.9	- 9 32.1	-0.3305	0.5678	0.0943	+23 -41
33 Tauri	6.0	+1.09	+6.8	+22 56.2	21 17.0	- 6 18.3	+0.9714	0.5678	+0.0862	+90 +32
161 B. Tauri	6.5	1.11	6.8	22 58.2	22 55.7	- 4 43.1	+1.0768	0.5677	0.0822	+90 +40
36 Tauri	5.6	1.13	7.0	23 52.8	27 0 21.8	- 3 20.2	+0.2316	0.5676	0.0787	+55 - 9
χ Tauri	5.3	1.24	7.2	25 26.2	8 4.2	+ 4 5.4	-0.8838	0.5668	0.0597	-11 -65
62 Tauri	6.1	1.24	6.7	24 6.6	8 41.5	+ 4 41.3	+0.5600	0.5667	0.0582	+81 +10
95 Tauri	6.2	+1.36	+6.2	+23 56.1	16 53.2	-11 24.8	+1.1459	0.5654	+0.0380	+90 +50
315 B. Tauri	6.3	1.44	6.0	24 27.7	22 27.4	- 6 2.7	+0.7580	0.5641	0.0242	+90 +24
k Tauri	5.6	1.45	6.1	24 55.5	23 15.6	- 5 16.3	+0.2818	0.5639	0.0223	+59 - 2
103 Tauri	5.5	1.51	5.5	24 9.5	28 3 33.3	- 1 7.9	+1.1787	0.5627	+0.0118	+90 +55
118 Tauri	5.4	1.64	5.1	25 5.1	12 42.3	+ 7 41.5	+0.1902	0.5597	-0.0103	+63 - 5
125 Tauri	5.1	+1.72	+5.0	+25 51.2	17 15.7	-11 54.8	-0.7107	0.5580	-0.0211	0 -63
132 Tauri	5.0	1.76	4.2	24 32.5	21 21.7	- 7 57.5	+0.6014	0.5564	0.0307	+86 +15
412 B. Tauri	5.8	1.80	3.7	24 14.4	29 0 52.0	- 4 34.5	+0.8084	0.5549	0.0388	+90 +26
139 Tauri	4.7	1.83	4.3	25 56.8	1 18.4	- 4 9.0	-1.0606	0.5547	0.0398	-26 -64
5 Geminorum	5.9	1.89	3.1	24 26.4	7 22.2	+ 1 42.2	+0.2914	0.5519	0.0535	+59 - 4
8 Geminorum	6.1	+1.91	+2.8	+23 59.9	9 31.3	+ 3 46.9	+0.6527	0.5509	-0.0583	+90 +15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
9 Geminorum	6.2	+1.92	+ 2.7	+23 46.2	29 9 49.4	+ 4 4.4	+0.8833	0.5508	-0.0589	+90	+28
36 B. Geminorum	6.0	1.96	2.1	23 22.5	13 41.9	+ 7 49.0	+1.0716	0.5489	0.0674	+90	+41
52 B. Geminorum	6.5	2.05	2.0	24 39.7	19 5.8	-10 58.2	-0.7277	0.5462	0.0788	- 1	-65
87 B. Geminorum	5.8	2.12	+ 0.9	23 42.1	30 1 48.8	- 4 28.7	-0.2538	0.5426	0.0926	+27	-37
44 Geminorum	5.9	2.18	- 0.1	22 45.8	8 2.1	+ 1 32.3	+0.1615	0.5393	0.1048	+51	-16
5 Geminorum	3.5	+2.25	- 1.1	+22 8.2	15 3.2	+ 8 19.7	+0.0689	0.5355	-0.1179	+45	-22
58 Geminorum	6.0	2.28	1.0	23 6.3	16 38.0	+ 9 51.4	-1.1873	0.5346	0.1208	-36	-67
149 B. Geminorum	6.4	2.27	1.7	21 42.1	18 17.0	+11 27.2	+0.1563	0.5338	0.1238	+50	-19
63 Geminorum	5.3	2.28	1.8	21 36.9	18 42.3	+11 51.7	+0.1992	0.5335	0.1245	+53	-16
79 Geminorum	6.3	2.35	3.1	20 30.9	31 3 9.1	- 3 57.5	+0.2994	0.5290	0.1390	+59	-13
SATURN	0.3	...	...	+21 40.6	4 11.1	- 2 57.4	-1.1265	0.5281	-0.1407	-29	-68
209 B. Geminorum	6.2	+2.37	- 3.9	19 32.2	6 29.9	- 0 43.0	+0.9053	0.5272	0.1444	+90	+20
85 Geminorum	5.2	2.40	3.9	20 6.2	8 19.2	+ 1 2.9	+0.0151	0.5262	0.1473	+42	-29
217 B. Geminorum	6.3	2.42	4.2	20 2.6	10 51.6	+ 3 30.6	-0.2987	0.5250	0.1513	+25	-46
10 H. Cancr	6.1	2.43	4.8	19 4.6	12 50.6	+ 5 25.9	+0.4679	0.5239	0.1543	+71	- 6
ζ Cancr (mean)	4.7	+2.44	- 5.6	+17 53.9	16 35.0	+ 9 3.5	+1.1839	0.5221	-0.1599	+90	+40
d^1 Cancr	5.9	2.51	6.0	18 35.9	22 12.4	+ 9 29.4	-0.5127	0.5193	0.1679	+13	-61
d^2 Cancr	6.2	+2.49	- 6.6	+17 19.1	23 29.1	- 8 15.0	+0.6876	0.5188	-0.1696	+90	+ 4

APRIL.

0 Cancr	5.5	+2.54	- 6.6	+18 22.4	1 2 24.1	- 5 25.3	-0.9814	0.5174	-0.1736	-16	-72
54 Cancr	6.3	2.58	8.5	15 39.4	12 27.9	+ 4 20.6	+0.2171	0.5130	0.1862	+53	-23
α^1 Cancr	5.1	2.61	8.9	15 38.4	15 42.2	+ 7 29.2	-0.3725	0.5118	0.1899	+21	-56
α^2 Cancr	5.7	2.61	8.8	15 53.9	15 52.6	+ 7 39.3	-0.6925	0.5117	0.1901	+ 3	-75
ϵ Leonis	5.1	+2.68	-12.0	+11 39.9	2 10 8.9	+ 1 24.1	+0.3497	0.5057	-0.2085	+61	-20
σ Leonis	3.8	2.69	12.8	10 16.0	15 7.0	+ 6 13.7	+0.8505	0.5044	0.2127	+90	+ 7
83 B. Leonis	5.9	2.73	13.7	9 19.4	23 23.8	- 9 43.5	+0.1064	0.5027	0.2190	+47	-33
89 B. Leonis	6.2	2.74	14.0	8 42.4	3 0 19.2	- 8 49.5	+0.5360	0.5026	0.2197	+79	- 8
π Leonis	4.9	2.79	14.1	8 26.3	1 27.5	- 7 43.2	+0.6313	0.5024	0.2205	+83	- 6
43 Leonis	6.3	+2.79	-15.5	+ 6 57.6	13 55.2	+ 4 23.8	-0.5304	0.5009	-0.2278	+13	-73
155 B. Leonis	6.5	2.78	15.7	6 6.7	14 4.0	+ 4 32.3	+0.3731	0.5009	0.2279	+63	-21
35 Sextantis	6.1	2.83	16.7	5 10.7	4 1 5.4	- 8 44.7	-1.1377	0.5007	0.2326	-24	-85
p^4 Leonis	5.7	2.86	17.9	2 24.1	14 2.2	+ 3 50.7	-1.1165	0.5016	0.2360	-22	-88
p^5 Leonis	5.3	2.88	18.4	0 22.6	17 46.5	+ 7 28.7	+0.2217	0.5021	0.2365	+53	-30
359 B. Leonis	6.3	+2.90	-18.6	+ 0 35.0	22 58.6	-11 27.9	-1.2340	0.5030	-0.2369	-32	-89
388 B. Leonis	6.3	2.90	19.0	- 1 14.9	5 1 28.8	- 9 1.8	+0.1773	0.5036	0.2370	+51	-32
e Leonis	5.1	2.90	19.2	2 33.0	2 47.6	- 7 45.1	+1.2906	0.5039	0.2370	+87	+38
431 B. Leonis	6.2	2.92	19.3	1 58.9	7 10.4	- 3 29.7	-0.3685	0.5049	0.2367	+22	-62
13 B. Virginis	5.9	2.94	19.8	4 52.6	13 58.6	+ 3 7.0	+1.1818	0.5068	0.2358	+85	+28
78 B. Virginis	6.5	+2.98	-20.0	- 5 15.8	6 2 19.8	- 8 53.0	-1.2904	0.5114	-0.2321	-40	-90
η Virginis	5.3	3.02	20.2	9 0.0	12 31.5	+ 1 0.9	+0.4185	0.5158	0.2272	+64	-19
370 B. Virginis	6.0	3.06	20.0	11 12.3	23 2.7	+11 13.3	+0.4431	0.5213	0.2201	+64	-18
75 Virginis	5.6	3.12	19.2	14 56.5	7 18 9.3	+ 5 44.5	+0.4104	0.5327	0.2020	+59	-19
83 Virginis	5.6	3.14	18.8	15 46.0	23 45.3	+11 9.8	+0.1803	0.5363	0.1953	+44	-81
85 Virginis	6.1	+3.14	-18.8	-15 21.4	8 0 16.8	+11 40.3	-0.3615	0.5367	-0.1946	+15	-63
43 H. Virginis	5.5	3.17	17.5	17 49.1	14 15.8	+ 1 11.9	-0.3241	0.5462	0.1749	+15	-60
231 G. Virginis	6.4	3.18	17.4	18 12.3	15 1.4	+ 1 56.1	-0.0465	0.5467	0.1737	+29	-44
236 G. Virginis	5.7	3.18	17.4	18 20.2	15 44.9	+ 2 38.1	-0.0322	0.5472	0.1726	+30	-43
9 G. Libræ	6.5	3.20	16.4	20 4.8	23 6.4	+ 9 44.7	+0.5909	0.5523	0.1603	+65	- 8
17 G. Libræ	6.4	+3.21	-15.8	-20 49.7	9 4 10.7	- 9 21.5	+0.5918	0.5558	-0.1513	+64	- 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallaxes.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$								
18 G. Libræ	6.1	+3.21	-15.7	-20 58.9	9 4 38.4	-8 54.8	+0.6834	0.5561	-0.1504	+69	-3
43 B. Libræ	5.7	3.22	15.7	21 2.8	9 7.2	-4 35.4	+0.0965	0.5592	0.1419	+33	-36
47 G. Libræ	6.1	3.22	14.6	21 42.8	13 5.2	-0 45.8	+0.2522	0.5618	0.1340	+41	-27
64 G. Libræ	5.8	3.21	14.0	22 5.8	17 23.3	+3 23.2	+0.0978	0.5646	0.1251	+32	-35
169 B. Libræ	6.0	3.20	12.6	22 52.2	10 2 31.0	-11 49.0	-0.1416	0.5701	0.1051	+17	-49
177 B. Libræ	6.2	+3.19	-12.5	-22 53.0	3 10.4	-11 11.0	-0.1970	0.5705	-0.1037	+14	-53
42 Libræ	5.0	3.20	12.3	23 33.2	3 33.2	-10 49.0	+0.4658	0.5707	0.1028	+51	-15
31 B. Scorpii	5.4	3.19	11.3	24 17.4	9 15.0	-5 19.9	+0.6892	0.5739	0.0894	+65	-2
32 B. Scorpii	5.3	3.18	11.4	23 44.1	9 16.3	-5 18.6	+0.1063	0.5739	0.0894	+28	-35
40 B. Scorpii	5.4	3.19	10.9	24 35.7	11 11.6	-3 27.7	+0.8391	0.5749	0.0848	+65	+8
50 B. Scorpii	6.4	+3.18	-10.6	-24 30.1	13 24.3	-1 19.9	+0.5584	0.5760	-0.0794	+15	-9
57 B. Scorpii	5.7	3.15	10.7	23 23.0	14 19.6	-0 26.6	-0.6813	0.5765	0.0771	+55	-90
24 G. Scorpii	6.2	3.16	10.4	24 14.6	15 2.4	+0 14.6	+0.1626	0.5768	0.0754	+31	-32
27 G. Scorpii	5.8	3.15	10.5	23 28.0	15 24.5	+0 35.8	-0.6754	0.5770	0.0745	+15	-90
41 G. Scorpii	6.3	3.15	10.0	24 12.8	17 28.0	+2 34.7	-0.0446	0.5780	0.0694	+18	-44
85 B. Scorpii	6.0	+3.17	-9.7	-25 16.2	17 55.0	+3 0.6	+1.0263	0.5782	-0.0682	+65	+22
19 Scorpii	4.9	3.13	9.6	23 58.4	20 17.3	+5 17.5	-0.4810	0.5792	0.0622	-5	-73
♄ Scorpii	3.1	3.16	9.3	25 23.8	20 29.6	+5 29.4	+0.9909	0.5793	0.0617	+65	+19
22 Scorpii	4.8	3.12	8.8	24 56.1	11 0 10.6	+9 1.9	+0.2994	0.5808	0.0522	+36	-24
126 B. Scorpii	6.1	3.08	8.2	24 18.6	4 48.4	-10 30.9	-0.5649	0.5825	0.0401	-12	-81
88 B. Ophiuchi	6.3	+3.03	-6.8	-24 58.1	12 11.1	-3 25.3	-0.1043	0.5847	-0.0205	+11	-47
26 Ophiuchi	5.8	3.03	6.8	24 51.9	12 15.8	-3 20.8	-0.2135	0.5847	0.0203	+5	-54
137 B. Ophiuchi	6.3	3.00	5.9	25 9.3	17 5.7	+1 17.8	+0.0206	0.5857	0.0072	+16	-40
39 Ophiuchi	5.1	2.95	5.8	24 11.9	19 25.1	+3 31.8	-0.9776	0.5861	-0.0009	-39	-90
♁ Ophiuchi	3.4	2.95	5.3	24 55.2	21 0.0	+5 2.9	-0.2307	0.5863	+0.0034	+3	-55
191 B. Ophiuchi	6.3	+2.92	-5.3	-24 10.2	22 14.6	+6 14.7	-0.9983	0.5865	+0.0068	-40	-90
♂ Ophiuchi	4.3	2.92	5.3	24 6.1	22 45.0	+6 43.9	-1.0651	0.5865	0.0082	-45	-90
136 G. Ophiuchi	6.3	2.96	4.6	25 52.3	22 56.6	+6 55.1	+0.7656	0.5866	0.0087	+64	+4
51 Ophiuchi	4.8	2.89	5.0	23 54.0	10 45.8	+8 40.0	-1.2497	0.5867	0.0137	-63	-78
151 G. Ophiuchi	6.0	2.94	4.2	26 12.5	0 51.4	+8 45.4	+1.1336	0.5867	0.0140	+64	+33
63 Ophiuchi	6.1	+2.82	-3.1	-24 52.4	10 5.4	-6 22.2	+0.0005	0.5870	+0.0392	+18	-41
4 Sagittarii	4.8	2.77	3.1	23 48.6	12 3.0	-4 29.3	-1.0099	0.5870	0.0445	-39	-90
7 Sagittarii	5.5	2.77	2.7	24 17.0	13 15.6	-3 19.5	-0.4675	0.5869	0.0478	-6	-72
9 Sagittarii	6.0	2.76	2.6	24 21.8	13 39.9	-2 56.2	-0.3647	0.5869	0.0489	0	-64
1 Sagittarii	5.2	2.72	2.3	23 43.2	16 47.9	+0 4.5	-0.8597	0.5866	0.0573	-27	-90
67 B. Sagittarii	6.4	+2.72	-1.3	-25 38.2	19 32.8	+2 42.9	+1.2765	0.5862	+0.0647	+65	+59
70 B. Sagittarii	6.4	2.69	1.3	24 57.2	20 41.2	+3 48.6	+0.6504	0.5860	0.0678	+61	-4
24 Sagittarii	5.7	2.61	0.8	24 5.7	1 38.4	+8 34.2	+0.1380	0.5852	0.0808	-30	-33
117 B. Sagittarii	5.8	2.57	0.6	23 34.6	3 29.9	+10 21.4	-0.2385	0.5848	0.0857	+10	-55
26 Sagittarii	6.1	2.57	0.3	23 54.7	4 50.0	+11 38.4	+0.2211	0.5845	0.0891	+35	-23
28 Sagittarii	5.6	+2.51	-0.5	-22 28.8	6 39.3	-10 36.6	-1.0770	0.5840	+0.0938	-39	-90
30 Sagittarii	6.2	2.49	-0.3	22 15.5	8 28.1	-8 52.0	-1.1291	0.5835	0.0984	-43	-90
γ^1 Sagittarii	5.0	2.48	+0.1	22 50.9	9 47.9	-7 35.3	-0.3926	0.5832	0.1018	+4	-66
γ^2 Sagittarii	5.1	2.48	0.1	22 46.6	10 10.7	-7 13.3	-0.4274	0.5830	0.1028	+2	-69
154 B. Sagittarii	5.9	2.48	0.4	23 16.8	10 32.1	-6 52.8	+0.1248	0.5830	0.1036	+31	-34
168 B. Sagittarii	6.3	+2.44	+0.5	-22 48.8	12 48.5	-4 41.7	-0.1104	0.5823	+0.1093	+18	-47
♄ Sagittarii	3.9	2.41	0.4	21 51.8	14 3.3	-3 29.7	-0.9409	0.5819	0.1124	-27	-90
191 B. Sagittarii	6.5	2.41	1.1	23 19.3	15 40.8	-1 56.0	+0.7328	0.5814	0.1164	+67	+1
199 B. Sagittarii	6.4	2.36	0.8	21 47.8	17 12.8	-0 27.6	-0.6415	0.5808	0.1201	-8	-89
222 B. Sagittarii	5.5	2.33	1.6	22 33.4	20 31.6	+2 43.7	+0.5451	0.5796	0.1280	+58	-11
50 Sagittarii	5.5	+2.29	+1.7	-21 56.5	22 51.3	+4 58.1	+0.2218	0.5788	+0.1335	+39	-29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
253 B. Sagittarii	6.1	+2.26	+1.8	-21 20.1	14 0 44.4	+6 46.8	+0.0130	0.5781	+0.1378	+28	-40
f Sagittarii	5.1	2.14	2.1	19 57.7	7 8.0	-11 4.1	-0.6091	0.5755	0.1521	-3	-84
57 Sagittarii	6.0	2.10	2.2	19 15.4	9 33.5	-8 44.0	-0.9495	0.5745	0.1573	-23	-90
e Capricorni	5.5	1.95	3.6	19 22.6	20 56.7	+2 13.8	+1.0978	0.5695	0.1802	+71	+25
z Capricorni	5.2	1.89	3.7	18 29.0	15 0 18.9	+5 28.7	+0.8103	0.5680	0.1865	+72	+4
p Capricorni	5.0	+1.88	+3.6	-18 5.3	0 58.6	+6 6.9	+0.5335	0.5677	+0.1877	+63	-12
47 B. Capricorni	6.2	1.82	3.5	16 48.6	3 50.0	+8 52.0	-0.2145	0.5664	0.1927	+22	-53
61 B. Capricorni	5.9	1.78	3.6	16 25.1	5 59.2	+10 56.6	-0.1913	0.5655	0.1964	+24	-52
94 B. Capricorni	5.7	1.69	4.3	16 21.0	13 22.3	-5 56.3	+1.2334	0.5623	0.2063	+74	+36
95 B. Capricorni	5.9	1.66	3.8	14 48.2	13 50.1	-5 29.4	-0.2307	0.5622	0.2090	+23	-54
53 B. Aquarii	6.5	+1.56	+4.1	-13 32.7	21 23.6	+1 47.9	+0.1228	0.5591	+0.2198	+43	-34
18' Aquarii	5.5	1.51	4.4	13 14.0	16 0 59.9	+5 16.6	+0.6094	0.5577	0.2244	+73	-8
72 B. Aquarii	6.5	1.48	4.1	11 55.6	2 47.8	+7 0.7	-0.3006	0.5571	0.2266	+22	-58
137 B. Capricorni	6.2	1.41	4.2	10 57.0	7 47.4	+11 49.9	-0.1378	0.5553	0.2324	+30	-49
c' Capricorni	5.3	1.37	3.9	9 27.8	10 16.2	-9 46.5	-1.0534	0.5546	0.2350	-21	-90
c' Capricorni	6.3	+1.37	+4.0	-9 39.5	10 50.0	-9 13.9	-0.7241	0.5544	+0.2356	0	-90
96 B. Aquarii	6.5	1.34	4.6	10 42.1	14 6.3	-6 4.4	+1.1007	0.5534	0.2388	+79	+22
6 Aquarii	4.3	1.21	4.6	8 11.7	17 0 35.5	+4 3.3	+1.1326	0.5507	0.2473	+82	+24
44 Aquarii	5.7	1.19	3.9	5 48.1	0 44.2	+4 11.7	-1.2366	0.5506	0.2474	-34	-90
170 B. Aquarii	6.0	1.17	4.6	7 36.8	3 38.4	+7 0.0	+1.3042	0.5500	0.2492	+83	+41
51 Aquarii	5.8	+1.15	+4.0	-5 15.4	3 54.9	+7 15.9	-0.9937	0.5500	+0.2494	-14	-90
κ Aquarii	5.2	1.09	4.2	4 39.3	10 7.8	-10 43.8	-0.0363	0.5489	0.2527	+39	-43
207 B. Aquarii	6.3	1.07	4.2	3 59.1	11 31.1	-9 23.3	-0.3580	0.5488	0.2533	+22	-62
6 G. Piscium	6.2	1.00	4.3	2 50.3	19 30.3	-1 40.3	+0.5256	0.5479	0.2558	+74	-13
22 B. Piscium	6.4	0.89	4.3	0 9.8	18 7 5.6	+9 31.6	+0.8117	0.5477	0.2567	+90	+2
κ Piscium	4.9	+0.88	+4.2	0 48.1	8 39.2	+11 2.0	+0.2423	0.5477	+0.2565	+55	-29
9 Piscium	6.4	0.88	4.2	0 40.1	8 48.0	+11 10.5	+0.4147	0.5477	0.2565	+66	-20
16 Piscium	5.7	0.84	4.3	1 38.6	12 59.8	-8 46.2	+0.5108	0.5480	0.2559	+72	-15
19 Piscium	5.4	0.81	4.2	3 1.6	17 34.5	-4 20.7	+0.2877	0.5483	0.2546	+57	-26
NEW MOON.											
20 Tauri	4.1	+0.83	+5.6	+24 6.7	23 2 4.5	+0 27.7	-0.8795	0.5733	+0.0967	-11	-66
21 Tauri	5.8	0.83	5.7	24 17.9	2 6.4	+0 29.5	-1.0721	0.5733	0.0966	-26	-66
22 Tauri	6.5	0.83	5.7	24 16.3	2 9.9	+0 33.0	-1.0388	0.5734	0.0965	-23	-66
23 Tauri	4.3	0 83	5.6	23 41.5	2 17.4	+0 40.2	-0.4207	0.5734	0.0962	+17	-47
γ Tauri	3.0	+0.84	+5.6	+23 51.1	2 46.3	+1 8.0	-0.5409	0.5734	+0.0950	+10	-56
104 B. Tauri	5.5	0.84	5.5	23 10.1	3 8.5	+1 29.4	+0.2081	0.5734	0.0941	+53	-13
27 Tauri	3.7	0.84	5.6	23 48.1	3 28.4	+1 48.6	-0.4239	0.5734	0.0933	+17	-47
28 Tauri	5.2	0.84	5.6	23 53.1	3 29.0	+1 49.1	-0.5104	0.5734	0.0933	+12	-53
33 Tauri	6.0	0.87	5.4	22 56.2	6 47.4	+5 0.1	+0.7790	0.5735	0.0852	+90	+19
161 B. Tauri	6.5	+0.88	+5.3	+22 58.2	8 24.8	+6 34.0	+0.8809	0.5735	+0.0812	+90	+26
36 Tauri	5.6	0.90	5.4	23 52.8	9 49.6	+7 55.6	+0.0373	0.5735	0.0777	+43	-20
χ Tauri	5.3	0.97	5.5	25 26.2	17 25.4	-8 45.4	-1.0847	0.5730	0.0588	-28	-65
62 Tauri	6.1	0.97	5.2	24 6.6	18 2.2	-8 10.0	+0.3497	0.5729	0.0572	+63	-2
95 Tauri	6.2	1.05	4.9	23 56.0	24 2 6.3	-0 23.8	+0.9186	0.5717	0.0369	+90	+33
315 B. Tauri	6.3	+1.11	+4.7	+24 27.7	7 35.2	+4 52.9	+0.5250	0.5705	+0.0232	+77	+11
99 Tauri	6.0	1.11	4.6	23 49.3	8 14.9	+5 31.3	+1.2214	0.5703	0.0215	+85	+59
k Tauri	5.6	1.12	4.8	24 55.5	8 22.6	+5 38.7	+0.0507	0.5703	0.0212	+44	-14
103 Tauri	5.5	1.16	4.4	24 9.5	12 36.1	+9 42.9	+0.9355	0.5691	+0.0106	+90	+36
118 Tauri	5.4	1.26	4.1	25 5.1	21 36.3	-5 36.6	-0.0583	0.5660	-0.0116	+38	-19
121 Tauri	5.1	+1.28	+3.6	+23 59.2	25 0 16.4	-3 2.3	+1.0807	0.5649	-0.0180	+90	+46

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	γ	α	γ'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
125 Tauri	5.1	+1.32	+4.0	+25 51.2	d 2 5.2	-1 17.4	-0.9585	0.5642	-0.0224	-17	-64
132 Tauri	5.0	+1.35	3.4	24 32.5	6 7.4	+2 36.2	+0.3398	0.5624	0.0320	+62	0
412 B. Tauri	5.8	+1.39	3.0	24 14.4	9 34.4	+5 55.8	+0.5415	0.5608	0.0401	+79	+10
5 Geminorum	5.9	+1.46	2.6	24 26.4	15 58.5	-11 53.7	+0.0214	0.5576	0.0548	+42	-19
8 Geminorum	6.1	+1.48	2.3	23 59.9	18 5.8	-9 50.9	+0.3781	0.5564	0.0596	+65	0
9 Geminorum	6.2	+1.48	+2.2	+23 46.2	18 23.5	-9 33.7	+0.6068	0.5563	-0.0602	+86	+12
36 B. Geminorum	6.0	+1.52	1.8	23 22.5	22 12.7	-5 52.5	+0.7904	0.5542	0.0687	+90	+21
52 B. Geminorum	6.5	+1.60	1.7	24 39.7	36 3 32.0	+0 44.1	-1.0015	0.5511	0.0801	-20	-65
87 B. Geminorum	5.8	+1.66	+0.8	23 42.1	10 9.8	+5 40.2	-0.5359	0.5472	0.0938	+11	-55
44 Geminorum	5.9	+1.72	0.0	22 45.8	16 18.5	+11 36.6	-0.1274	0.5434	0.1059	+34	-32
120 B. Geminorum	6.5	+1.73	-0.8	+21 23.6	18 34.6	-10 11.8	+1.1245	0.5420	-0.1102	+90	+40
6 Geminorum	3.5	+1.79	0.9	22 8.2	23 14.9	-5 40.8	-0.2232	0.5391	0.1189	+28	-38
149 B. Geminorum	6.4	+1.81	1.3	21 42.1	27 2 26.8	-2 35.3	-0.1378	0.5372	0.1246	+33	-35
61 Geminorum	5.8	+1.80	1.8	20 25.4	2 30.0	-2 32.1	+1.2560	0.5371	0.1248	+84	+53
63 Geminorum	5.3	+1.82	1.4	21 36.9	2 51.8	-2 10.9	-0.0954	0.5369	0.1254	+36	-32
79 Geminorum	6.3	+1.90	-2.6	+20 30.9	11 14.0	+5 55.1	+0.0014	0.5318	-0.1396	+41	-29
209 B. Geminorum	6.2	+1.92	3.3	19 32.3	14 33.2	+9 8.0	+0.6038	0.5298	0.1460	+83	+2
85 Geminorum	5.2	+1.95	3.2	20 6.2	16 21.7	+10 53.1	-0.2827	0.5286	0.1479	+25	-45
217 B. Geminorum	6.3	+1.98	3.5	20 2.6	18 53.0	-10 40.3	-0.5955	0.5271	0.1517	+8	-65
10 H. Cancr	6.1	+1.98	4.0	19 4.6	20 51.2	-8 45.8	+0.1675	0.5260	0.1547	+51	-22
ζ Cancr (mean)	4.7	+2.00	-4.8	+17 53.9	28 0 34.3	-5 9.6	+0.8806	0.5238	-0.1602	+90	+16
d^1 Cancr	5.9	+2.07	5.1	18 35.9	6 9.9	+0 15.8	-0.8093	0.5207	0.1680	-4	-71
d^2 Cancr	6.2	+2.06	5.7	17 19.1	7 26.3	+1 29.8	-0.3868	0.5200	0.1697	+65	-12
θ Cancr	5.5	+2.11	5.6	18 22.4	10 20.6	+4 18.9	-1.2761	0.5185	0.1735	-44	-72
54 Cancr	6.3	+2.16	7.5	15 39.4	20 22.6	-9 57.0	-0.0786	0.5135	0.1856	+37	-39
α^1 Cancr	5.1	+2.20	-7.8	+15 38.4	23 36.5	-6 48.8	-0.6655	0.5120	-0.1893	+5	-74
α^2 Cancr	5.7	+2.20	7.7	15 53.9	23 46.9	-6 38.7	-0.9845	0.5119	0.1895	-15	-74
ξ Leonis	5.1	+2.32	10.8	11 39.9	29 18 3.1	+11 6.1	+0.0675	0.5049	0.2072	+45	-34
σ Leonis	3.8	+2.34	11.7	10 16.0	23 1.6	-8 3.9	+0.5724	0.5034	0.2112	+78	-9
83 B. Leonis	5.9	+2.41	12.6	9 19.4	30 7 19.5	0 0.0	-0.1620	0.5015	0.2172	+32	-48
89 B. Leonis	6.2	+2.41	-12.9	+8 42.4	8 14.9	+0 53.9	+0.3183	0.5012	-0.2178	+59	-23
π Leonis	4.9	+2.42	13.1	8 26.4	9 23.5	+2 0.5	+0.3649	0.5011	0.2186	+62	-20
43 Leonis	6.3	+2.51	14.5	6 57.6	21 53.4	-9 50.3	-0.7795	0.4994	0.2256	-1	-83
155 B. Leonis	6.5	+2.50	-14.8	+6 6.7	22 2.2	-9 41.8	+0.1239	0.4994	-0.2257	+48	-34

MAY.

35 Sextantis	6.1	+2.58	-15.7	+5 10.8	1 9 5.6	+1 3.4	-1.3690	0.4990	-0.2302	-51	-78
p^3 Leonis	6.1	+2.64	17.7	0 26.5	20 15.9	+11 55.2	+1.2506	0.4999	0.2331	+90	+34
p^4 Leonis	5.7	+2.66	17.3	2 24.1	22 4.8	-10 18.9	-1.3244	0.5001	0.2334	-43	-86
p^5 Leonis	5.3	+2.69	-18.0	+0 22.6	2 1 49.7	-6 40.3	+0.0206	0.5007	-0.2340	+42	-40
388 B. Leonis	6.3	+2.74	18.8	-1 14.9	9 32.8	+0 50.0	-0.0081	0.5024	0.2344	+40	-41
e Leonis	5.1	+2.75	19.1	2 33.0	10 51.8	+2 6.8	+1.1072	0.5027	0.2344	+87	+22
431 B. Leonis	6.2	+2.79	19.1	1 58.9	15 14.9	+6 22.5	-0.5413	0.5039	0.2342	+12	-75
13 B. Virginis	5.9	+2.83	20.0	4 52.6	22 3.4	-11 0.5	+1.0224	0.5062	0.2333	+85	+16
64 B. Virginis	6.5	+2.91	-20.6	-7 19.1	3 8 23.3	-0 58.2	+1.2732	0.5103	-0.2305	+83	+37
q Virginis	5.3	+3.02	20.9	9 0.0	20 33.8	+10 51.0	+0.3126	0.5164	0.2251	+56	-24
370 B. Virginis	6.0	+3.10	21.1	11 12.3	4 7 2.0	-2 59.6	+0.3626	0.5226	0.2183	+58	-23
75 Virginis	5.6	+3.27	20.6	14 56.5	5 1 59.4	-8 37.7	+0.3766	0.5354	0.2006	+56	-21
83 Virginis	5.6	+3.32	20.4	15 46.1	7 31.8	-3 16.0	+0.1613	0.5395	0.1940	+42	-32
85 Virginis	6.1	+3.32	-20.3	-15 21.4	8 3.0	-2 45.8	-0.3763	0.5399	-0.1934	+14	-64

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		α	δ	α	d	h	m	h	m	α	δ		
43 H. Virginis	5.5	+3.44	-19.2	-17 49.2	5	21	51.3	+10 35.1	-0.3055	0.5505	-0.1739	+16 59	
231 G. Virginis	6.4	3.45	19.2	18 12.3	22	36.3	+11 18.6	-0.0279	0.5510	0.1727	+30 42		
236 G. Virginis	5.7	3.46	19.1	18 20.2	23	19.2	+12 0.0	-0.0120	0.5516	0.1716	+31 42		
9 G. Libræ	6.5	3.53	18.4	20 4.8	6	6	34.0	-5 0.0	+0.6237	0.5572	0.1594	+66 5	
17 G. Libræ	6.4	3.57	17.8	20 49.8	11	33.4	-0 11.1	+0.6357	0.5611	0.1504	+66 5		
18 G. Libræ	6.1	+3.57	-17.7	-20 58.9	12	0.7	+0 15.2	+0.7277	0.5614	-0.1495	+69 0		
43 B. Libræ	5.7	3.62	17.7	21 2.8	16	25.0	+4 30.1	+0.1549	0.5648	0.1410	+36 32		
47 G. Libræ	6.1	3.63	16.5	21 42.8	20	18.8	+8 15.5	+0.3179	0.5676	0.1332	+44 23		
64 G. Libræ	5.8	3.65	15.8	22 5.8	7	0	32.3	-11 40.2	+0.1737	0.5707	0.1243	+35 31	
169 B. Libræ	6.0	3.69	14.3	22 52.3	9	29.7	-3 2.7	-0.0451	0.5767	0.1042	+22 44		
177 B. Libræ	6.2	+3.70	-14.2	-22 53.0	10	8.4	-2 25.4	-0.0987	0.5771	-0.1027	+19 47		
42 Libræ	5.0	3.71	14.0	23 33.2	10	30.8	-2 3.9	+0.5592	0.5774	0.1018	+56 9		
31 B. Scorpïi	5.4	3.74	13.0	24 17.4	16	5.9	+3 18.5	+0.7917	0.5808	0.0884	+66 5		
32 B. Scorpïi	5.3	3.73	13.0	23 44.1	16	7.2	+3 19.8	+0.2139	0.5808	0.0884	+34 29		
40 B. Scorpïi	5.4	3.75	12.6	24 35.8	18	0.3	+5 8.6	+0.9441	0.5818	0.0838	+65 +16		
50 B. Scorpïi	6.4	+3.75	-12.2	-24 30.1	20	10.3	+7 13.6	+0.6698	0.5830	-0.0783	+62 3		
57 B. Scorpïi	5.7	3.72	12.1	23 23.0	21	4.6	+8 5.9	-0.5573	0.5835	0.0760	-8 80		
24 G. Scorpïi	6.2	3.74	11.9	24 14.6	21	46.6	+8 46.3	+0.2805	0.5838	0.0743	+36 25		
27 G. Scorpïi	5.8	3.73	11.9	23 28.1	22	8.2	+9 7.0	-0.5495	0.5840	0.0734	-8 79		
41 G. Scorpïi	6.3	3.74	11.4	24 12.8	8	0	9.2	+11 3.4	+0.0796	0.5850	0.0682	+25 36	
85 B. Scorpïi	6.0	+3.77	-11.2	-25 16.2	0	35.7	+11 28.9	+1.1419	0.5853	-0.0671	+65 +34		
19 Scorpïi	4.9	3.74	10.9	23 58.4	2	55.2	-10 17.0	-0.3479	0.5863	0.0610	+2 63		
o Scorpïi	3.1	3.78	10.7	25 23.9	3	7.3	-10 5.4	+1.1116	0.5864	0.0605	+65 +30		
p Ophiuchi	4.7	3.72	10.6	23 15.6	4	54.6	-8 22.3	-1.2011	0.5872	0.0558	-54 89		
22 Scorpïi	4.8	3.76	10.0	24 56.2	6	44.0	-6 37.1	+0.4326	0.5881	0.0510	+44 16		
126 B. Scorpïi	6.1	+3.73	-9.1	-24 18.6	11	16.4	-2 15.3	-0.4164	0.5897	-0.0388	-4 68		
88 B. Ophiuchi	6.3	3.73	7.4	24 58.1	18	30.5	+4 41.6	+0.0525	0.5917	0.0191	+19 38		
26 Ophiuchi	5.8	3.73	7.5	24 51.9	18	35.1	+4 46.1	-0.0556	0.5917	0.0188	+13 44		
137 B. Ophiuchi	6.3	3.72	6.4	25 9.3	23	19.6	+9 19.2	+0.1841	0.5927	-0.0056	+25 30		
o Ophiuchi	3.4	3.70	5.6	24 55.2	9	3	9.6	-11 0.0	-0.0591	0.5932	+0.0051	+12 44	
191 B. Ophiuchi	6.3	+3.67	-5.4	-24 10.2	4	22.8	-9 49.7	-0.8188	0.5933	+0.0085	-29 90		
b Ophiuchi	4.3	3.66	5.4	24 6.1	4	52.7	-9 21.0	-0.8843	0.5933	0.0099	-33 90		
136 G. Ophiuchi	6.3	3.71	5.0	25 52.3	5	4.1	-9 10.0	+0.9322	0.5934	0.0104	+64 +15		
51 Ophiuchi	4.8	3.65	5.0	23 54.1	6	51.3	-7 27.1	-1.0646	0.5935	0.0155	-45 90		
63 Ophiuchi	6.1	3.61	2.7	24 52.3	16	1.5	+1 21.1	+0.1892	0.5933	0.0410	+29 30		
4 Sagittarii	4.8	+3.57	-2.5	-23 48.6	17	57.3	+3 12.4	-0.8116	0.5930	+0.0463	-26 90		
7 Sagittarii	5.5	3.57	2.2	24 17.0	19	8.7	+4 20.9	-0.2714	0.5929	0.0496	+5 58		
9 Sagittarii	6.0	3.57	2.1	24 21.8	19	32.6	+4 43.9	-0.1688	0.5928	0.0507	+10 51		
1 Sagittarii	5.2	3.53	1.5	23 43.2	22	37.8	+7 41.7	-0.6566	0.5923	0.0592	-15 90		
70 B. Sagittarii	6.4	3.53	-0.4	24 57.2	10	2	27.8	+11 22.6	+0.8489	0.5915	0.0696	+65 +9	
24 Sagittarii	5.7	+3.46	+0.4	-24 5.7	7	21.1	-7 55.7	+0.3455	0.5902	+0.0826	+41 21		
117 B. Sagittarii	5.8	3.43	0.7	23 34.6	9	11.2	-6 9.9	-0.0267	0.5897	0.0874	+21 42		
26 Sagittarii	6.1	3.42	1.0	23 54.7	10	30.4	-4 53.9	+0.4319	0.5892	0.0909	+47 16		
28 Sagittarii	5.6	3.37	1.0	22 28.8	12	18.4	-3 10.1	-0.8575	0.5886	0.0956	-24 90		
30 Sagittarii	6.2	3.34	1.3	22 15.5	14	6.0	-1 26.7	-0.9076	0.5879	0.1002	-26 90		
r ¹ Sagittarii	5.0	+3.34	+1.8	-22 50.9	15	25.0	-0 10.8	-0.1733	0.5874	+0.1035	+14 51		
r ² Sagittarii	5.1	3.34	1.8	22 46.5	15	47.5	+0 10.8	-0.2076	0.5873	0.1045	+13 53		
154 B. Sagittarii	5.9	3.34	2.0	23 16.8	16	8.6	+0 31.2	+0.3425	0.5872	0.1053	+43 22		
168 B. Sagittarii	6.3	3.31	2.4	22 48.8	18	23.8	+2 41.0	+0.1107	0.5862	0.1110	+30 35		
o Sagittarii	3.9	3.27	2.3	21 51.8	19	37.8	+3 52.1	-0.7152	0.5857	0.1140	-13 90		
191 B. Sagittarii	6.5	+3.29	+3.1	-23 19.3	21	14.5	+5 25.1	+0.9533	0.5850	+0.1179	+67 +16		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	γ	α'	γ'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
π Sagittarii	3.0	+3.23	+2.5	-21 9.4	10 21 41.0	+ 5 50.6	-1.1948	0.5848	+0.1190	-48	-90
199 B. Sagittarii	6.4	3.23	2.9	21 47.8	22 45.6	+ 6 52.6	-0.4143	0.5843	0.1216	+ 4	-67
222 B. Sagittarii	5.5	3.21	3.8	22 33.4	11 2 3.0	+10 2.4	+0.7713	0.5828	0.1295	+67	+ 3
50 Sagittarii	5.5	3.17	4.1	21 56.4	4 21.8	-11 44.1	+0.4511	0.5817	0.1348	+52	-16
253 B. Sagittarii	6.1	3.14	4.3	21 29.1	6 14.1	- 9 56.1	+0.2445	0.5807	0.1391	+40	-27
f Sagittarii	5.1	+3.02	+5.0	-19 57.6	12 36.0	+ 3 48.7	-0.3717	0.5775	+0.1531	+ 9	-64
57 Sagittarii	6.0	2.97	5.2	19 15.3	15 1.0	- 1 29.1	-0.7102	0.5761	0.1582	- 9	-90
π Capricorni	5.2	2.76	7.3	18 29.0	12 5 46.4	-11 16.6	+1.0568	0.5679	0.1865	+72	+21
31 B. Capricorni	6.4	2.71	6.5	16 0.9	6 24.1	-10 40.2	-1.3244	0.5675	0.1876	-58	-76
ρ Capricorni	5.0	2.74	7.2	18 5.2	6 26.1	-10 38.3	+0.7800	0.5675	0.1877	+72	+ 2
47 B. Capricorni	6.2	+2.68	+7.2	-16 48.6	9 18.2	- 7 52.5	+0.0319	0.5659	+0.1928	+35	-39
τ Capricorni	5.2	2.64	6.9	15 14.7	10 55.7	- 6 18.5	-1.2373	0.5650	0.1953	-43	-90
61 B. Capricorni	5.9	2.65	7.4	16 25.1	11 27.9	- 5 47.4	+0.0556	0.5648	0.1962	+37	-38
95 B. Capricorni	5.9	2.52	7.9	14 48.1	19 21.6	+ 1 49.4	+0.0169	0.5604	0.2082	+36	-40
53 B. Aquarii	6.5	2.40	8.4	13 32.7	12 2 59.1	+ 9 10.8	-0.3713	0.5565	0.2184	+57	-21
18 Aquarii	5.5	+2.34	+8.7	-13 14.0	6 37.8	-11 18.1	+0.8595	0.5547	+0.2228	+77	+ 6
72 B. Aquarii	6.5	2.30	8.4	11 55.6	8 26.9	- 9 32.8	-0.0555	0.5539	0.2249	+34	-44
137 B. Capricorni	6.2	2.23	8.6	10 56.9	13 30.3	- 4 39.8	+0.1063	0.5516	0.2302	+43	-35
c^1 Capricorni	5.3	2.18	8.3	9 27.7	16 1.2	-21 14.1	-0.8163	0.5506	0.2327	- 7	-90
c^2 Capricorni	6.3	2.17	8.5	9 39.4	16 35.5	- 1 41.0	-0.4853	0.5503	0.2332	+13	-71
96 B. Aquarii	6.5	+2.14	+9.1	-10 42.0	19 54.8	+ 1 31.6	+1.3500	0.5490	+0.2362	+76	+50
θ Aquarii	4.3	1.98	9.2	8 11.7	14 6 34.6	+11 49.8	+1.3759	0.5454	0.2439	+74	+54
44 Aquarii	5.7	1.96	8.3	5 48.0	6 43.5	+11 58.4	-1.0131	0.5453	0.2440	-17	-90
51 Aquarii	5.8	1.91	8.4	5 15.3	9 57.8	- 8 53.8	-0.7714	0.5444	0.2458	- 1	-90
κ Aquarii	5.2	1.84	8.6	4 39.2	16 18.2	- 2 46.0	+0.1878	0.5430	0.2487	+51	-31
207 B. Aquarii	6.3	+1.81	+8.5	- 3 59.0	17 43.3	- 1 23.7	-0.1385	0.5427	+0.2493	+33	-49
6 G. Piscium	6.2	1.71	8.6	2 50.3	15 1 52.9	+ 6 29.8	+0.7436	0.5414	0.2514	+87	- 1
22 B. Piscium	6.4	1.57	8.4	- 0 9.7	13 44.4	- 6 2.0	+1.0160	0.5407	0.2518	+90	+15
κ Piscium	4.9	1.55	8.1	+ 0 48.2	15 20.3	- 4 29.3	+0.4378	0.5407	0.2516	+67	-18
9 Piscium	6.4	1.55	8.2	0 40.1	15 29.2	- 4 20.7	+0.6120	0.5407	0.2516	+81	- 9
16 Piscium	5.7	+1.50	+8.1	+ 1 38.6	19 47.2	- 0 11.2	+0.7021	0.5408	+0.2508	+90	- 3
19 Piscium	5.4	1.45	7.9	3 1.7	16 0 28.6	+ 4 21.0	+0.4683	0.5412	0.2495	+69	-16
36 Piscium	6.2	1.31	6.9	7 46.9	14 34.7	- 6 0.7	-0.8980	0.5433	0.2427	- 8	-82
d Piscium	5.4	1.30	7.1	7 43.9	16 27.1	- 4 12.0	-0.3937	0.5437	0.2414	+20	-62
136 B. Piscium	6.5	1.22	7.0	8 54.3	17 1 59.4	+ 5 1.3	+0.6768	0.5461	0.2338	+88	- 3
75 Piscium	6.3	+1.14	+6.4	+12 30.8	13 35.3	- 7 46.2	-0.3719	0.5498	+0.2219	+21	-58
η Piscium	3.7	1.08	6.1	14 55.2	18 0 50.1	+ 3 5.5	-0.4266	0.5538	0.2076	+18	-59
101 Piscium	6.2	1.07	6.3	14 14.4	2 45.8	+ 4 57.3	+0.6713	0.5546	0.2048	+89	+ 1
105 Piscium	6.1	1.06	6.0	15 59.2	4 29.6	+ 6 37.5	-0.7752	0.5553	0.2023	- 2	-74
3 Arietis	6.4	1.04	5.8	17 0.0	7 33.9	+ 9 35.4	-1.2048	0.5565	0.1977	-34	-73
4 Arietis	5.8	+1.04	+5.9	+16 32.7	8 16.6	+10 16.7	-0.5960	0.5567	+0.1966	+ 8	-68
5 Arietis	5.1	1.03	5.8	17 24.9	12 19.8	- 9 48.6	-0.7102	0.5583	+0.1901	+ 2	-73
NEW MOON.											
132 Tauri	5.0	+1.22	+2.5	+24 32.5	22 14 51.5	-10 51.8	+0.1996	0.5655	-0.0337	+53	- 7
412 B. Tauri	5.8	+1.24	+2.2	+24 14.4	18 17.4	- 7 33.3	+0.3957	0.5641	-0.0418	+66	+ 3
5 Geminorum	5.9	1.29	1.8	24 26.4	23 0 39.1	- 1 25.2	-0.1331	0.5610	0.0565	+33	-27
8 Geminorum	6.1	1.30	1.6	23 59.9	2 45.4	+ 0 36.7	+0.2199	0.5599	0.0612	+54	- 9
9 Geminorum	6.2	1.30	1.5	23 46.2	3 3.1	+ 0 53.8	+0.4477	0.5597	0.0619	+70	+ 3
36 B. Geminorum	6.0	1.32	1.2	23 22.5	6 50.6	+ 4 33.3	+0.6255	0.5577	0.0704	+88	+12
52 B. Geminorum	6.5	+1.38	+1.1	+24 39.7	12 7.6	+ 9 39.3	-1.1699	0.5547	-0.0818	-36	-65

ELEMENTS FOR THE PREDICTION OF OCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
87 B. Geminorum	5.8	+1.42	+0.3	+23 42.1	23	18	42.3	-7 59.5	-0.7138	0.5509	-0.0955	0	-66
44 Geminorum	5.9	1.46	-0.3	22 45.8	24	0	48.2	-2 5.9	-0.3138	0.5470	0.1076	+23	-42
120 B. Geminorum	6.5	1.46	0.9	21 23.6		3	3.2	+0 4.6	+0.9322	0.5457	0.1119	+90	+26
δ Geminorum	3.5	1.51	1.0	22 8.2		7	41.4	+4 33.6	-0.4175	0.5427	0.1206	+17	-50
56 Geminorum	5.2	1.50	1.5	20 36.1		8	34.2	+5 24.6	+1.1517	0.5421	0.1222	+90	+42
149 B. Geminorum	6.4	+1.52	-1.4	+21 42.1		10	51.7	+7 37.6	-0.3358	0.5406	-0.1263	+22	-46
61 Geminorum	5.8	1.52	1.7	20 25.4		10	54.9	+7 40.7	+1.0545	0.5405	0.1264	+90	+33
63 Geminorum	5.3	1.53	1.5	21 36.9		11	16.6	+8 1.8	-0.2939	0.5403	0.1270	+24	-43
79 Geminorum	6.3	1.59	2.4	20 30.9		19	35.1	-7 55.9	-0.2059	0.5349	0.1412	+29	-40
209 B. Geminorum	6.2	1.61	3.0	19 32.3		22	52.9	-4 44.3	+0.3918	0.5328	0.1465	+65	-9
85 Geminorum	5.2	+1.63	-3.0	+20 6.2	25	0	40.6	-3 0.2	-0.4942	0.5316	-0.1494	+14	-58
217 B. Geminorum	6.3	1.65	3.2	20 2.6		3	11.0	-0 34.5	-0.8086	0.5300	0.1532	-5	-70
10 H. Cancr	6.1	1.66	3.6	19 4.6		5	8.4	+1 19.2	-0.0490	0.5288	0.1561	+38	-33
ζ Cancr (<i>mean</i>)	4.7	1.68	4.3	17 53.9		8	50.2	+4 54.2	+0.6596	0.5264	0.1615	+89	+4
d^1 Cancr	5.9	1.73	4.5	18 35.9		14	23.9	+10 17.7	-1.0312	0.5230	0.1692	-20	-71
d^2 Cancr	6.2	+1.72	-5.0	+17 19.2		15	39.9	+11 31.3	+0.1619	0.5223	-0.1709	+50	-24
90 B. Cancr	6.3	1.75	6.0	15 36.0		20	53.6	-7 24.5	+1.1462	0.5192	0.1775	+90	+34
54 Cancr	6.3	1.82	6.8	15 39.4	26	4	32.8	+0 1.0	-0.3105	0.5151	0.1865	+24	-51
α^1 Cancr	5.1	1.85	6.8	15 38.4		7	46.2	+3 8.7	-0.8981	0.5134	0.1900	-9	-74
α^2 Cancr	5.7	1.85	6.8	15 53.9		7	56.6	+3 18.8	-1.2169	0.5133	0.1902	-35	-74
222 B. Cancr	6.3	+1.90	-9.0	+11 50.8		18	39.8	-10 16.6	+1.1641	0.5082	-0.2008	+90	+32
ϵ Leonis	5.1	1.97	9.6	11 39.9	27	2	11.4	-2 57.9	-0.1710	0.5052	0.2072	+32	-47
σ Leonis	3.8	2.00	10.4	10 16.1		7	10.2	+1 52.5	+0.3337	0.5034	0.2110	+60	-21
83 B. Leonis	5.9	2.07	11.3	9 19.4		15	29.0	+9 57.3	-0.4005	0.5008	0.2167	+20	-62
89 B. Leonis	6.2	2.07	11.6	8 42.4		16	24.6	+10 51.4	+0.0803	0.5007	0.2173	+45	-35
π Leonis	4.9	+2.08	-11.8	+8 26.4		17	33.3	+11 58.2	+0.1271	0.5003	-0.2180	+48	-32
43 Leonis	6.3	2.19	13.1	6 57.7	28	6	6.2	+0 10.3	-1.0154	0.4979	0.2245	-16	-83
155 B. Leonis	6.5	2.17	13.3	6 6.7		6	15.0	+0 18.8	-0.1104	0.4979	0.2245	+35	-46
237 B. Leonis	6.3	2.30	15.9	1 27.7		22	18.8	-8 3.7	+1.3667	0.4970	0.2299	+80	+51
55 Leonis	6.1	2.32	16.1	1 10.5	29	0	14.2	-6 11.5	+1.2385	0.4971	0.2304	+90	+34
p^2 Leonis	6.1	+2.35	-16.5	+0 26.5		4	37.3	-1 55.5	+1.0327	0.4974	-0.2312	+90	+17
p^3 Leonis	5.3	2.41	16.7	+0 22.7		10	13.8	+3 31.7	-0.1957	0.4980	0.2318	+30	-51
388 B. Leonis	6.3	2.48	17.6	-1 14.9		18	0.9	+11 6.0	-0.2169	0.4994	0.2321	+29	-53
e Leonis	5.1	2.49	18.0	2 33.0		19	20.6	-11 36.5	+0.9030	0.4997	0.2320	+87	+8
431 B. Leonis	6.2	2.53	17.9	1 58.9		23	46.0	-7 18.5	-0.7455	0.5008	0.2317	+1	-90
13 B. Virginis	5.9	+2.60	-19.1	-4 52.6	30	6	38.2	-0 37.8	+0.8308	0.5030	-0.2307	+85	+4
64 B. Virginis	6.5	2.71	19.9	7 19.1		17	3.8	+9 30.1	+1.0956	0.5071	0.2279	+83	+22
η Virginis	5.3	2.85	20.4	9 0.0	31	5	20.6	-2 34.4	+0.1497	0.5133	0.2224	+47	-33
370 B. Virginis	6.0	+2.98	-20.8	-11 12.3		15	53.6	+7 39.8	+0.2159	0.5196	-0.2156	+49	-29

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75 Virginis	5.6	+3.22	-20.8	-14 56.5	1	10	57.4	+2 8.3	+0.2613	0.5334	-0.1983	+49	-27
83 Virginis	5.6	3.30	20.7	15 46.1		16	30.8	+7 31.0	+0.0553	0.5378	0.1918	+37	-38
85 Virginis	6.1	3.30	20.5	15 21.4		17	2.1	+8 1.3	-0.4814	0.5382	0.1912	+10	-71
43 H. Virginis	5.5	+3.49	-19.8	-17 49.2	2	6	51.3	-2 37.0	-0.3858	0.5499	-0.1720	+12	-65
231 G. Virginis	6.4	3.50	19.7	18 12.3		7	36.2	-1 53.6	-0.1072	0.5505	0.1709	+26	-47
236 G. Virginis	5.7	3.51	19.7	18 20.1		8	19.1	-1 12.1	-0.0900	0.5511	0.1698	+26	-46
9 G. Libræ	6.5	3.63	19.2	20 4.9		15	33.0	+5 46.9	+0.5570	0.5574	0.1578	+62	-10
17 G. Libræ	6.4	3.70	18.7	20 49.8		20	31.4	+10 34.8	+0.5775	0.5617	0.1488	+62	-9
18 G. Libræ	6.1	+3.70	-18.6	-20 58.9		20	58.5	+11 0.8	+0.6700	0.5621	-0.1480	+68	-3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
43 B. Libræ	5.7	+3.79	-18.8	-21 2.9	3 1 21.5	- 8 45.5	+0.1066	0.5658	-0.1396	+33	-35
47 G. Libræ	6.1	3.81	17.4	21 42.9	5 13.9	- 5 1.4	+0.2755	0.5691	0.1318	+42	-25
64 G. Libræ	5.8	3.86	16.8	22 5.9	9 25.5	- 0 59.1	+0.1392	0.5726	0.1230	+33	-33
169 B. Libræ	6.0	3.96	15.2	22 52.3	18 18.0	+ 7 33.5	-0.0633	0.5796	0.1030	+20	-44
177 B. Libræ	6.2	3.97	15.1	22 53.0	18 56.2	+ 8 10.3	-0.1155	0.5800	0.1015	+18	-48
42 Libræ	5.0	+3.99	-15.1	-23 33.2	19 18.4	+ 8 31.7	+0.5394	0.5803	-0.1007	+55	-10
31 B. Scorpïi	5.4	4.05	14.1	24 17.4	4 0 49.7	-10 9.8	+0.7793	0.5842	0.0873	+66	+ 5
32 B. Scorpïi	5.3	4.04	14.0	23 44.1	0 50.9	-10 8.7	+0.2052	0.5843	0.0872	+33	-29
40 B. Scorpïi	5.4	4.08	13.7	24 35.8	2 42.6	- 8 21.3	+0.9337	0.5855	0.0826	+65	+15
50 B. Scorpïi	6.4	4.09	13.2	24 30.1	4 50.9	- 6 17.9	+0.6646	0.5869	0.0772	+62	- 3
57 B. Scorpïi	5.7	+4.07	-12.9	-23 23.1	5 44.4	- 5 26.5	-0.5527	0.5875	-0.0749	- 8	-80
24 G. Scorpïi	6.2	4.10	12.8	24 14.7	6 25.8	- 4 46.5	+0.2805	0.5879	0.0731	+36	-25
27 G. Scorpïi	5.8	4.08	12.7	23 28.1	6 47.2	- 4 26.1	-0.5431	0.5882	0.0722	- 8	-79
41 G. Scorpïi	6.3	4.11	12.3	24 12.8	8 46.5	- 2 31.5	+0.0849	0.5894	0.0671	+25	-36
85 B. Scorpïi	6.0	4.14	12.2	25 16.2	9 12.6	- 2 6.4	+1.1402	0.5896	0.0659	+65	+33
19 Scorpïi	4.9	+4.12	-11.7	-23 58.4	11 30.0	+ 0 5.6	-0.3350	0.5910	-0.0599	+ 2	-62
♄ Scorpïi	3.1	4.16	11.7	25 23.9	11 41.9	+ 0 17.0	+1.1137	0.5911	0.0593	+65	+31
♍ Ophiuchi	4.7	4.11	11.2	23 15.6	13 27.5	+ 1 58.4	-1.1781	0.5920	0.0546	-52	-90
22 Scorpïi	4.8	4.17	10.8	24 56.2	15 15.1	+ 3 41.8	+0.4456	0.5929	0.0498	+45	-16
126 B. Scorpïi	6.1	4.18	9.7	24 18.6	19 43.0	+ 7 59.0	-0.3893	0.5951	0.0375	- 3	-66
88 B. Ophiuchi	6.3	+4.22	- 8.0	-24 58.2	5 2 49.2	- 9 11.8	+0.0868	0.5978	-0.0176	+21	-36
26 Ophiuchi	5.8	4.22	8.0	24 51.9	2 53.7	- 9 7.5	-0.0202	0.5978	0.0174	+15	-42
137 B. Ophiuchi	6.3	4.25	6.8	25 9.3	7 32.6	- 4 40.0	+0.2244	0.5991	-0.0042	+27	-28
39 Ophiuchi	5.1	4.22	6.2	24 12.0	9 46.7	- 2 31.3	-0.7491	0.5997	+0.0023	-26	-90
♄ Ophiuchi	3.4	4.24	5.8	24 55.2	11 17.9	- 1 3.8	-0.0108	0.6000	0.0066	+14	-41
191 B. Ophiuchi	6.3	+4.22	- 5.5	-24 10.2	12 29.7	+ 0 5.1	-0.7610	0.6002	+0.0101	-26	-90
♄ Ophiuchi	4.3	4.22	5.4	24 6.1	12 58.9	+ 0 33.0	-0.8251	0.6003	0.0115	-29	-90
136 G. Ophiuchi	6.3	4.27	5.3	25 52.3	13 10.0	+ 0 43.7	+0.9732	0.6002	0.0120	+64	+19
51 Ophiuchi	4.8	4.21	4.9	23 54.1	14 55.0	+ 2 24.5	-1.0005	0.6005	0.0171	-40	-90
63 Ophiuchi	6.1	4.24	2.5	24 52.3	23 52.9	+11 0.3	+0.2533	0.6009	0.0429	+32	-26
4 Sagittarii	4.8	+4.20	- 2.1	-23 48.6	6 1 46.0	-11 11.2	-0.7338	0.6007	+0.0484	-19	-90
7 Sagittarii	5.5	4.21	1.7	24 17.0	2 55.8	-10 4.2	-0.1979	0.6007	0.0517	+ 8	-53
9 Sagittarii	6.0	4.21	1.6	24 21.8	3 19.2	- 9 41.9	-0.0958	0.6006	0.0528	+14	-47
1 Sagittarii	5.2	4.18	- 0.9	23 43.2	6 20.0	- 6 48.4	-0.5739	0.6002	0.0614	-11	-82
70 B. Sagittarii	6.4	4.21	+ 0.3	24 57.2	10 4.4	- 3 13.1	+0.9195	0.5996	0.0719	+65	+14
24 Sagittarii	5.7	+4.16	+ 1.4	-24 5.7	14 50.6	+ 1 21.4	+0.4284	0.5984	+0.0851	+46	-17
117 B. Sagittarii	5.8	4.13	1.8	23 34.6	16 37.9	+ 3 4.4	+0.0628	0.5979	0.0900	+26	-37
26 Sagittarii	6.1	4.14	2.2	23 54.7	17 55.2	+ 4 18.5	+0.5178	0.5975	0.0935	+53	-12
28 Sagittarii	5.6	4.08	2.4	22 28.8	19 40.5	+ 5 59.6	-0.7543	0.5969	0.0982	-17	-90
30 Sagittarii	6.2	4.06	2.8	22 15.4	21 25.4	+ 7 40.3	-0.8016	0.5963	0.1028	-19	-90
♊ Sagittarii	5.0	+4.08	+ 3.2	-22 50.8	22 42.5	+ 8 54.3	-0.0742	0.5958	+0.1062	+20	-45
♊ Sagittarii	5.1	4.07	3.3	22 46.5	23 4.4	+ 9 15.4	-0.1077	0.5957	0.1071	+18	-47
154 B. Sagittarii	5.9	4.08	3.5	23 16.8	23 25.1	+ 9 35.1	+0.4364	0.5955	0.1080	+49	-16
168 B. Sagittarii	6.3	4.05	4.0	22 48.7	7 1 36.8	+11 41.6	+0.2101	0.5946	0.1137	+36	-29
♄ Sagittarii	3.9	4.02	4.1	21 51.8	2 49.0	-11 9.1	-0.6046	0.5940	0.1168	- 7	-85
191 B. Sagittarii	6.5	+4.05	+ 4.7	-23 19.3	4 23.3	- 9 38.6	+1.0462	0.5934	+0.1208	+67	+23
♄ Sagittarii	3.0	3.98	4.5	21 9.3	4 49.2	- 9 13.7	-1.0760	0.5932	0.1219	-37	-90
199 B. Sagittarii	6.4	3.99	4.8	21 47.7	5 52.2	- 8 13.2	-0.3034	0.5927	0.1245	+10	-60
222 B. Sagittarii	5.5	3.99	5.8	22 33.4	9 4.6	- 5 8.4	+0.8721	0.5912	0.1324	+67	+10
50 Sagittarii	5.5	3.95	6.2	21 56.4	11 19.9	- 2 58.4	+0.5583	0.5899	0.1378	+59	-10
253 B. Sagittarii	6.1	+3.92	+ 6.5	-21 29.0	13 9.5	- 1 13.1	+0.3562	0.5890	+0.1422	+47	-21

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y'</i>	<i>z'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
<i>f</i> Sagittarii	5.1	+3.82	+ 7.6	19 57.6	7 19 22.0	+ 4 44.8	-0.2459	0.5854	+0.1563	+16	-55
57 Sagittarii	6.0	3.78	8.0	19 15.3	21 43.5	+ 7 0.9	-0.5781	0.5841	0.1613	- 1	-81
π Capricorni	5.2	3.60	10.7	18 28.9	8 12 8.4	- 3 7.0	+1.1838	0.5750	0.1897	+72	+33
31 B. Capricorni	6.4	3.54	10.2	16 0.8	12 45.4	- 2 31.4	-1.1721	0.5746	0.1908	-37	-90
ρ Capricorni	5.0	3.59	10.7	18 5.2	12 47.3	- 2 29.6	+0.9105	0.5746	0.1908	+72	+11
47 B. Capricorni	6.2	+3.53	+10.9	-16 48.5	15 35.6	+ 0 12.5	+0.1726	0.5728	+0.1956	+42	-31
τ Capricorni	5.2	3.48	10.8	15 14.6	17 11.1	+ 1 44.4	-1.0827	0.5718	0.1983	-29	-90
61 B. Capricorni	5.9	3.49	11.2	16 25.0	17 42.6	+ 2 14.8	+0.1978	0.5714	0.1992	+44	-30
95 B. Capricorni	5.9	3.37	12.0	14 48.1	9 1 26.8	+ 9 41.9	+0.1654	0.5665	0.2110	+44	-32
53 B. Aquarii	6.5	3.25	12.8	13 32.6	8 55.9	- 7 5.0	+0.5216	0.5619	0.2210	+67	-13
18 Aquarii	5.5	+3.21	+13.2	-13 13.9	12 30.9	- 3 37.6	+1.0083	0.5598	+0.2252	+77	+16
72 B. Aquarii	6.5	3.16	13.1	11 55.5	14 18.3	- 1 54.1	+0.1013	0.5588	0.2272	+42	-35
137 B. Capricorni	6.2	3.09	13.4	10 56.8	19 17.2	+ 2 54.4	+0.2641	0.5560	0.2323	+52	-27
<i>c</i> ¹ Capricorni	5.3	3.04	13.2	9 27.6	21 46.0	+ 5 18.1	-0.6514	0.5547	0.2347	+ 4	-86
<i>c</i> ² Capricorni	6.3	3.03	13.4	9 39.4	22 19.8	+ 5 50.7	-0.3224	0.5544	0.2352	+21	-60
30 Aquarii	5.6	+2.90	+13.3	- 6 55.2	10 6 0.0	-10 44.9	-1.2480	0.5506	+0.2412	-37	-90
44 Aquarii	5.7	2.81	13.5	5 47.9	12 18.4	- 4 39.3	-0.8455	0.5479	0.2451	- 6	-90
51 Aquarii	5.8	2.77	13.6	5 15.2	15 31.2	- 1 33.0	-0.6050	0.5466	0.2468	+ 8	-80
κ Aquarii	5.2	2.69	13.9	4 39.2	21 49.1	+ 4 32.3	+0.3505	0.5444	0.2492	+60	-22
207 B. Aquarii	6.3	2.67	13.8	3 58.9	23 13.7	+ 5 54.1	+0.0251	0.5439	0.2497	+42	-40
6 G. Piscium	6.2	+2.56	+14.0	- 2 50.2	11 7 21.7	-10 14.1	+0.9045	0.5418	+0.2512	+87	+ 8
22 B. Piscium	6.4	2.41	13.7	0 9.6	19 13.2	+ 1 14.1	+1.1745	0.5397	0.2509	+90	+28
κ Piscium	4.9	2.39	13.4	+ 0 48.3	20 49.3	+ 2 47.0	+0.5955	0.5396	0.2506	+79	- 9
9 Piscium	6.4	2.39	13.5	0 40.2	20 58.3	+ 2 55.7	+0.7697	0.5395	0.2506	+90	0
16 Piscium	5.7	2.33	13.3	1 38.7	12 1 17.1	+ 7 6.1	+0.8581	0.5392	0.2496	+90	+ 6
19 Piscium	5.4	+2.27	+13.0	+ 3 1.8	6 0.0	+11 39.8	+0.6217	0.5391	+0.2480	+82	- 8
ω Piscium	4.0	2.21	12.0	6 24.4	12 5.0	- 6 27.1	-1.3238	0.5392	0.2452	-44	-83
36 Piscium	6.2	2.12	11.7	7 47.0	20 12.6	+ 1 24.6	-0.7589	0.5399	0.2404	0	-82
<i>d</i> Piscium	5.4	2.10	11.8	7 44.0	22 6.2	+ 3 14.4	-0.2542	0.5402	0.2390	+27	-54
136 B. Piscium	6.5	2.00	11.4	8 54.3	13 7 45.1	-11 25.6	+0.8129	0.5418	0.2311	+90	+ 5
58 Piscium	5.7	+1.98	+10.6	+11 31.5	10 27.2	- 8 48.9	-1.2590	0.5424	+0.2285	-37	-78
75 Piscium	6.3	1.90	10.3	12 30.9	19 30.7	- 0 3.4	-0.2530	0.5447	0.2189	+27	-51
η Piscium	3.7	1.81	9.4	14 55.3	14 6 56.3	+10 59.1	-0.3207	0.5483	0.2044	+23	-53
101 Piscium	6.2	1.80	9.6	14 14.4	8 54.0	-11 7.1	+0.7828	0.5490	0.2017	+90	+ 7
105 Piscium	6.1	1.79	9.1	15 59.3	10 39.6	- 9 25.0	-0.6761	0.5496	0.1992	+ 4	-73
3 Arietis	6.4	+1.76	+ 8.8	+17 0.0	13 47.0	- 6 24.0	-1.1126	0.5507	+0.1945	-25	-73
4 Arietis	5.8	1.76	8.8	16 32.7	14 30.4	- 5 42.0	-0.5002	0.5510	0.1934	+14	-62
ϵ Arietis	5.1	1.73	8.5	17 24.9	18 38.0	- 1 42.9	-0.6201	0.5525	0.1870	+ 7	-69
35 B. Arietis	6.4	1.71	8.3	17 51.4	21 29.1	+ 1 2.2	-0.5541	0.5535	0.1823	+11	-64
47 B. Arietis	6.5	1.69	8.4	17 38.2	23 18.1	+ 2 47.5	+0.0036	0.5542	0.1793	+41	-32
20 H ¹ . Arietis	6.4	+1.69	+ 8.5	+16 50.3	15 0 1.5	+ 3 29.4	+0.9655	0.5545	+0.1781	+90	+22
15 Arietis	5.9	1.70	7.9	19 6.7	0 33.7	+ 4 0.5	-1.3085	0.5547	0.1771	-51	-70
θ Arietis	5.6	1.67	7.7	19 31.2	3 54.0	+ 7 13.9	-1.1542	0.5559	0.1713	-31	-70
26 Arietis	6.2	1.64	7.6	19 29.4	9 26.2	-11 25.5	-0.2032	0.5580	0.1613	+80	-41
μ Arietis	5.7	1.61	7.4	19 39.6	14 35.6	- 6 26.9	+0.4247	0.5598	0.1514	+68	- 7
47 Arietis	5.8	+1.58	+ 7.0	+20 20.3	21 26.5	+ 0 9.4	+0.7053	0.5622	+0.1377	+90	+10
ϵ Arietis (<i>mean</i>)	4.6	1.57	6.8	21 0.7	21 56.0	+ 0 37.9	+0.0668	0.5624	0.1366	+45	-24
ζ Arietis	5.0	1.53	6.5	20 44.4	16 4 44.1	+ 7 11.4	+1.2348	0.5645	0.1223	+87	+52
66 Arietis	6.1	1.52	5.9	22 31.2	10 32.6	-11 12.6	+0.0322	0.5660	0.1095	+43	-23
16 Tauri	5.4	1.50	5.3	24 1.8	17 31.8	- 4 28.5	-0.8548	0.5677	0.0936	- 9	-66
17 Tauri	3.8	+1.50	+ 5.4	+23 51.3	17 33.7	- 4 26.7	-0.6655	0.5677	+0.0935	+ 3	-63

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	'	d h m	h m				'	'
<i>g</i> Tauri	4.3	+1.50	+5.3	+24 12.6	16 17 42.0	4 18.7	-1.0280	0.5677	+0.0932	-22	-66
20 Tauri	4.1	1.50	5.3	24 6.6	17 57.9	4 3.3	-0.8990	0.5678	0.0926	-12	-66
21 Tauri	5.8	1.50	5.3	24 17.9	17 59.8	4 1.5	-1.0940	0.5678	0.0925	-28	-66
22 Tauri	6.5	1.50	5.3	24 16.3	18 3.4	3 57.9	-1.0604	0.5678	0.0924	-25	-66
23 Tauri	4.3	1.50	5.4	23 41.5	18 11.1	3 50.6	-0.4358	0.5678	0.0921	+16	-48
<i>7</i> Tauri	3.0	+1.50	+5.3	+23 51.1	18 40.6	3 22.2	-0.5589	0.5679	+0.0909	+9	-56
104 B. Tauri	5.5	1.49	5.4	23 10.1	19 3.3	3 0.4	+0.1974	0.5680	0.0901	+53	-12
27 Tauri	3.7	1.50	5.3	23 48.1	19 23.6	2 40.7	-0.4427	0.5680	0.0893	+16	-48
28 Tauri	5.2	1.50	5.3	23 53.1	19 24.2	2 40.2	-0.5303	0.5680	0.0892	+11	-54
33 Tauri	6.0	1.48	5.2	22 56.2	22 46.6	0 34.8	+0.7624	0.5686	0.0814	+90	+19
161 B. Tauri	6.5	+1.47	+5.1	+22 58.2	17 0 25.8	+2 10.7	+0.8600	0.5689	+0.0774	+90	+24
NEW MOON.											
79 Geminorum	6.3	+1.53	-2.6	+20 30.9	21 3 22.8	+1 39.5	-0.2750	0.5365	-0.1423	+26	-44
209 B. Geminorum	6.2	1.54	3.0	19 32.3	6 40.2	+4 50.6	+0.3208	0.5345	0.1477	+60	-13
85 Geminorum	5.2	+1.55	-3.1	+20 6.2	8 27.8	+6 34.8	-0.5674	0.5333	-0.1505	+10	-63
217 B. Geminorum	6.3	1.56	3.3	20 2.6	10 57.9	+9 0.1	-0.8840	0.5317	0.1544	-10	-70
10 H. Cancr	6.1	1.56	3.6	19 4.6	12 55.1	+10 53.6	-0.1251	0.5305	0.1573	+34	-37
ζ Cancr (<i>mean</i>)	4.7	1.57	4.1	17 53.9	16 36.3	+9 32.1	+0.5814	0.5283	0.1627	+81	-1
d^1 Cancr	5.9	1.60	4.4	18 35.9	22 9.3	+4 9.3	-1.1145	0.5249	0.1703	-26	-71
d^2 Cancr	6.2	+1.59	-4.8	+17 19.2	23 25.1	+2 55.9	+0.0786	0.5241	-0.1720	+45	-28
90 B. Cancr	6.3	1.61	5.5	15 36.0	23 43.1	+2 7.8	+1.0604	0.5210	0.1787	+90	+27
54 Cancr	6.3	1.65	6.0	15 39.5	12 16.3	+9 32.3	-0.4018	0.5168	0.1876	+19	-57
o^1 Cancr	5.1	1.68	6.3	15 38.4	15 29.3	-11 20.5	-0.9918	0.5150	0.1911	-16	-74
o^2 Cancr	5.7	1.68	6.2	15 53.9	15 39.6	-11 10.4	-1.3110	0.5149	0.1912	-48	-74
222 B. Cancr	6.3	+1.71	-8.0	+11 50.8	23 21.8	-0 46.9	+1.0672	0.5096	-0.2017	+90	+24
ξ Leonis	5.1	1.75	8.6	11 39.9	9 53.1	+6 31.5	-0.2725	0.5063	0.2080	+26	-52
o Leonis	3.8	1.78	9.3	10 16.1	14 51.8	+11 21.7	+0.2313	0.5043	0.2117	+54	-26
83 B. Leonis	5.9	1.83	10.0	9 19.5	23 10.9	+4 33.1	-0.5069	0.5013	0.2171	+14	-69
89 B. Leonis	6.2	1.84	10.3	8 42.5	24 0 6.6	-3 38.9	-0.0253	0.5011	0.2177	+39	-40
π Leonis	4.9	+1.84	-10.4	+8 26.4	1 15.4	-2 32.0	+0.0215	0.5007	-0.2183	+42	-38
43 Leonis	6.3	1.93	11.7	6 57.7	13 50.3	+9 42.2	-1.1264	0.4976	0.2244	-24	-83
155 B. Leonis	6.5	1.92	11.9	6 6.7	13 59.2	+9 50.8	-0.2190	0.4975	0.2245	+29	-52
237 B. Leonis	6.3	2.03	14.2	1 27.7	25 6 7.9	+1 33.1	+1.2633	0.4957	0.2293	+90	+36
55 Leonis	6.1	2.05	14.4	1 10.5	8 4.1	+3 26.1	+1.1347	0.4956	0.2297	+90	+24
p^3 Leonis	6.1	+2.08	-14.8	+0 26.5	12 29.2	+7 44.1	+0.9287	0.4956	-0.2303	+90	+10
p^4 Leonis	5.3	2.14	15.1	+0 22.7	18 8.6	-10 45.7	-0.3044	0.4959	0.2307	+25	-58
388 B. Leonis	6.3	2.21	15.9	-1 14.8	26 2 0.2	-3 7.0	-0.3245	0.4968	0.2306	+24	-59
e Leonis	5.1	2.22	16.3	2 33.0	3 20.7	+1 48.7	+0.8017	0.4970	0.2306	+87	+9
431 B. Leonis	6.2	2.27	16.3	1 58.9	7 49.1	+2 32.4	-0.8547	0.4978	0.2301	-6	-90
13 B. Virginis	5.9	+2.33	-17.4	+4 52.6	14 46.3	+9 18.1	+0.7326	0.4995	-0.2289	+85	-2
64 B. Virginis	6.5	2.45	18.4	7 19.1	27 1 20.4	+4 25.5	+1.0033	0.5030	0.2257	+83	+15
g Virginis	5.3	2.60	19.0	9 0.0	13 48.3	+7 41.2	+0.0568	0.5086	0.2200	+42	-38
370 B. Virginis	6.0	2.74	19.6	11 12.3	28 0 31.6	-5 54.2	+0.1290	0.5145	0.2131	+45	-34
75 Virginis	5.6	3.02	20.0	14 56.5	19 55.1	-11 6.1	+0.1859	0.5278	0.1957	+45	-31
83 Virginis	5.6	+3.11	-20.0	-15 46.1	29 1 34.3	-5 37.5	-0.0179	0.5322	-0.1893	+33	-42
85 Virginis	6.1	3.12	19.8	15 21.4	2 6.1	-5 6.8	-0.5579	0.5326	0.1886	+5	-78
43 H. Virginis	5.5	3.35	19.4	17 49.2	16 8.9	+8 28.7	-0.4521	0.5444	0.1697	+8	-69
231 G. Virginis	6.4	3.37	19.4	18 12.3	16 54.5	+9 12.8	-0.1713	0.5451	0.1686	+22	-51
236 G. Virginis	5.7	3.38	19.4	18 20.2	17 38.1	+9 54.9	-0.1535	0.5457	0.1675	+23	-50
9 G. Libræ	6.5	+3.52	-19.1	-20 4.9	30 0 58.6	-6 59.5	+0.5021	0.5522	-0.1557	+58	-13

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
17 G. Libræ	6.4	+3.61	-18.7	-20 49.8	30 6 1.2	2 7.4	+0.5258	0.5567	-0.1469	+59	-12
18 G. Libræ	6.1	3.62	18.6	20 58.9	6 28.6	1 41.0	+0.6190	0.5571	0.1461	+65	-7
43 B. Libræ	5.7	3.72	18.8	21 2.9	10 55.0	+ 236.0	+0.0559	0.5611	0.1378	+30	-38
47 G. Libræ	6.1	3.76	17.6	21 42.9	14 50.3	+ 622.9	+0.2282	0.5646	0.1302	+39	-28
64 G. Libræ	5.8	+3.83	-17.0	-22 5.9	19 4.7	+10 28.1	+0.0942	0.5683	-0.1215	+31	-36

JULY.

169 B. Libræ	6.0	+3.98	-15.6	-22 52.3	1 4 2.4	- 454.0	-0.1028	0.5760	-0.1017	+18	-47
177 B. Libræ	6.2	3.99	15.4	22 53.0	4 40.9	- 416.9	-0.1546	0.5765	0.1003	+15	-50
42 Libræ	5.0	+4.01	-15.5	-23 33.2	5 3.3	3 55.4	+0.5020	0.5768	-0.0994	+53	-13
31 B. Scorpii	5.4	4.11	14.6	24 17.4	10 37.0	+ 125.6	+0.7458	0.5813	0.0862	+66	+ 2
32 B. Scorpii	5.3	4.09	14.4	23 44.1	10 38.2	+ 126.8	+0.1706	0.5813	0.0862	+31	-31
40 B. Scorpii	5.4	4.14	14.2	24 35.8	12 30.6	+ 314.9	+0.9014	0.5828	0.0816	+65	+12
50 B. Scorpii	6.4	4.17	13.7	24 30.1	14 39.7	+ 519.0	+0.6332	0.5844	0.0762	+60	- 5
57 B. Scorpii	5.7	+4.15	-13.3	-23 23.1	15 33.4	+ 610.7	-0.5848	0.5851	-0.0740	-10	-83
24 G. Scorpii	6.2	4.18	13.3	24 14.7	16 15.1	+ 650.7	+0.2497	0.5856	0.0722	+35	-26
27 G. Scorpii	5.8	4.17	13.1	23 28.1	16 36.5	+ 711.3	-0.5744	0.5858	0.0713	-10	-82
41 G. Scorpii	6.3	4.21	12.8	24 12.9	18 36.3	+ 9 6.5	+0.0554	0.5873	0.0662	+23	-38
85 B. Scorpii	6.0	4.25	12.9	25 16.2	19 2.5	+ 931.6	+1.1115	0.5875	0.0651	+65	+30
19 Scorpii	4.9	+4.24	-12.1	-23 58.4	21 20.4	+11 44.1	-0.3628	0.5891	-0.0591	0	-64
σ Scorpii	3.1	4.28	12.3	25 23.9	21 32.3	+11 55.5	+1.0863	0.5893	0.0585	+65	+28
ρ Ophiuchi	4.7	4.24	11.5	23 15.6	23 18.3	-10 22.7	-1.2044	0.5904	0.0539	-55	-88
22 Scorpii	4.8	4.31	11.4	24 56.2	2 1 6.1	- 839.1	+0.4201	0.5916	0.0491	+43	-17
126 B. Scorpii	6.1	4.34	10.2	24 18.6	5 34.2	- 421.8	-0.4113	0.5942	0.0369	- 4	-68
88 B. Ophiuchi	6.3	+4.44	- 8.4	-24 58.2	12 39.9	+ 226.8	+0.0686	0.5978	-0.0170	+20	-37
26 Ophiuchi	5.8	4.44	8.4	24 51.9	12 44.4	+ 231.2	-0.0381	0.5979	0.0168	+14	-43
137 B. Ophiuchi	6.3	4.49	7.2	25 9.3	17 22.4	+ 657.9	+0.2087	0.5998	-0.0035	+26	-29
39 Ophiuchi	5.1	4.47	6.4	24 12.0	19 35.9	+ 9 5.9	-0.7603	0.6006	+0.0029	-26	-90
θ Ophiuchi	3.4	4.51	6.1	24 55.2	21 6.6	+10 32.9	-0.0235	0.6012	0.0073	+14	-42
191 B. Ophiuchi	6.3	+4.50	- 5.6	-24 10.2	22 18.0	+11 41.3	-0.7702	0.6014	+0.0107	-26	-90
b Ophiuchi	4.3	4.50	5.6	24 6.1	22 47.0	-11 50.9	-0.8336	0.6016	0.0121	-30	-90
136 G. Ophiuchi	6.3	4.56	5.7	25 52.3	22 58.1	-11 40.2	+0.9578	0.6016	0.0127	+64	+17
51 Ophiuchi	4.8	4.50	5.0	23 54.1	2 0 42.3	-10 0.2	-1.0069	0.6021	0.0177	-41	-90
63 Ophiuchi	6.1	4.59	2.5	24 52.3	9 35.6	- 128.9	+0.2466	0.6036	0.0437	+32	-27
4 Sagittarii	4.8	+4.56	- 1.9	-23 48.6	11 27.5	+ 0 18.4	-0.7337	0.6038	+0.0492	-21	-90
7 Sagittarii	5.5	4.58	1.6	24 17.0	12 36.5	+ 124.6	-0.2002	0.6038	0.0525	+ 8	-53
9 Sagittarii	6.0	4.59	1.5	24 21.8	12 59.6	+ 146.6	-0.0986	0.6039	0.0537	+14	-47
1 Sagittarii	5.2	4.58	- 0.6	23 43.2	15 58.2	+ 437.9	-0.5718	0.6039	0.0623	-10	-82
70 B. Sagittarii	6.4	4.63	+ 0.4	24 57.2	19 39.7	+ 810.2	+0.9132	0.6037	0.0729	+65	+13
24 Sagittarii	5.7	+4.61	+ 1.9	-24 5.7	4 0 21.6	-11 19.5	+0.4278	0.6031	+0.0863	+46	-16
117 B. Sagittarii	5.8	4.59	2.3	23 34.6	2 7.2	- 938.3	+0.0661	0.6028	0.0913	+26	-37
26 Sagittarii	6.1	4.60	2.7	23 54.7	3 23.2	- 825.4	+0.5179	0.6028	0.0948	+53	-12
28 Sagittarii	5.6	4.56	3.3	22 28.7	5 6.8	- 646.2	-0.7423	0.6022	0.0996	-17	-90
30 Sagittarii	6.2	4.54	3.7	22 15.4	6 49.8	- 5 7.3	-0.7880	0.6018	0.1043	-19	-90
γ ¹ Sagittarii	5.0	+4.57	+ 4.1	-22 50.8	8 5.4	3 54.8	-0.0666	0.6014	+0.1077	+20	-45
γ ² Sagittarii	5.1	4.57	4.2	22 46.5	8 27.0	- 334.1	-0.0996	0.6013	0.1087	+19	-47
154 B. Sagittarii	5.9	4.58	4.3	23 16.8	8 47.2	- 314.7	+0.4397	0.6012	0.1096	+49	-16
168 B. Sagittarii	6.3	4.56	4.9	22 48.7	10 56.5	- 110.7	+0.2165	0.6006	0.1154	+36	-29
o Sagittarii	3.9	4.53	5.2	21 51.8	12 7.3	- 0 2.8	-0.5897	0.6001	0.1185	- 6	-83
191 B. Sagittarii	6.5	+4.58	+ 5.7	-23 19.2	13 39.7	+ 125.8	+1.0457	0.5996	+0.1226	+67	+99

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.		Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.	
			$\Delta\alpha$	$\Delta\delta$									
π	Sagittarii	3.0	+4.50	+5.8	-21 9.3	d 4 14 5.0	+1 50.1	-1.0553	0.5995	+0.1237	-35	-90	
199 B.	Sagittarii	6.4	4.52	6.0	21 47.7	15 6.8	+2 49.4	-0.2899	0.5991	0.1263	+11	-59	
222 B.	Sagittarii	5.5	4.54	6.9	22 33.4	18 15.2	+5 50.1	+0.8748	0.5979	0.1344	+67	+10	
50	Sagittarii	5.5	4.51	7.6	21 56.4	20 27.5	+7 57.2	+0.5653	0.5969	0.1399	+60	-9	
253 B.	Sagittarii	6.1	4.50	8.0	21 29.0	22 14.6	+9 39.9	+0.3661	0.5961	0.1443	+48	-21	
f	Sagittarii	5.1	+4.42	+9.5	-19 57.5	5 4 18.3	-8 31.0	-0.2264	0.5932	+0.1587	+17	-54	
57	Sagittarii	6.0	4.39	10.0	19 15.2	6 36.3	-6 18.5	-0.5535	0.5919	0.1640	0	-78	
π	Capricorni	5.2	4.28	13.3	18 28.9	20 38.3	+7 10.7	+1.1915	0.5838	0.1929	+72	+33	
31 B.	Capricorni	6.4	4.21	13.2	16 0.8	21 14.2	+7 45.1	-1.1330	0.5835	0.1940	-33	-90	
ρ	Capricorni	5.0	4.26	13.4	18 5.1	21 16.0	+7 46.9	+0.9220	0.5834	0.1941	+72	+12	
47 B.	Capricorni	6.2	+4.21	+13.8	-16 48.5	23 59.6	+10 24.2	+0.1949	0.5817	+0.1990	+44	-30	
τ	Capricorni	5.2	4.16	13.9	15 14.6	6 1 32.3	+11 53.5	-1.0429	0.5808	0.2018	-25	-90	
61 B.	Capricorni	5.9	4.18	14.3	16 25.0	2 3.0	-11 37.2	+0.2205	0.5805	0.2026	+45	-29	
95 B.	Capricorni	5.9	4.08	15.5	14 48.0	9 33.6	+4 23.4	+0.1909	0.5758	0.2147	+45	-30	
53 B.	Aquarii	6.5	3.99	16.6	13 32.5	16 49.3	+2 36.2	+0.5441	0.5712	0.2248	+68	-12	
18	Aquarii	5.5	+3.95	+17.2	-13 13.8	20 17.8	+5 57.0	+1.0248	0.5692	+0.2292	+77	+17	
72 B.	Aquarii	6.5	3.91	17.2	11 55.4	22 1.9	+7 37.3	+0.1311	0.5681	0.2312	+44	-34	
137 B.	Capricorni	6.2	3.85	17.7	10 56.8	7 2 51.8	-11 43.3	+0.2928	0.5653	0.2364	+54	-25	
c^1	Capricorni	5.3	3.80	17.7	9 27.5	5 16.0	-9 24.2	-0.6092	0.5639	0.2388	+6	-81	
c^2	Capricorni	6.3	3.80	17.9	9 39.3	5 48.9	-8 52.5	-0.2848	0.5636	0.2392	+23	-57	
30	Aquarii	5.6	+3.69	+18.2	-6 55.1	13 15.3	-1 42.0	-1.1960	0.5596	+0.2453	-31	-90	
44	Aquarii	5.7	3.61	18.6	5 47.8	19 22.5	+4 12.4	-0.7986	0.5566	0.2491	-3	-90	
51	Aquarii	5.8	3.57	18.8	5 15.1	22 29.7	+7 13.0	-0.5612	0.5552	0.2507	+10	-76	
κ	Aquarii	5.2	3.50	19.1	4 39.1	8 4 36.9	-10 52.3	+0.3821	0.5526	0.2530	+63	-21	
207 B.	Aquarii	6.3	3.48	19.1	3 58.8	5 59.2	-9 32.9	+0.0610	0.5520	0.2534	+44	-37	
6 G.	Piscium	6.2	+3.39	+19.4	-2 50.1	13 54.2	-1 54.0	+0.9299	0.5493	+0.2547	+87	+10	
3	Piscium	6.3	3.36	18.7	0 15.3	14 59.4	-0 51.0	-1.3737	0.5490	0.2548	-52	-78	
22 B.	Piscium	6.4	3.25	19.3	0 9.5	1 1 28.3	+9 16.6	+1.1978	0.5462	0.2539	+90	+30	
κ	Piscium	4.9	3.23	19.0	+0 48.4	3 2.2	+10 47.4	+0.6253	0.5459	0.2535	+82	-8	
9	Piscium	6.4	3.23	19.1	0 40.3	3 10.9	+10 55.8	+0.7975	0.5459	0.2535	+90	+2	
16	Piscium	5.7	+3.18	+19.0	+1 38.8	7 24.1	-8 59.5	+0.8852	0.5452	+0.2522	+90	+7	
19	Piscium	5.4	3.13	18.7	3 1.9	12 1.2	-4 31.6	+0.6513	0.5446	0.2504	+85	-6	
ω	Piscium	4.0	3.07	17.6	6 24.5	17 59.2	+1 14.5	-1.2765	0.5440	0.2473	-38	-84	
36	Piscium	6.2	2.99	17.3	7 47.1	10 1 58.8	+8 58.1	-0.7187	0.5438	0.2419	+3	-82	
d	Piscium	5.4	2.97	17.3	7 44.1	3 50.6	+10 46.2	-0.2184	0.5439	0.2405	+29	-51	
136 B.	Piscium	6.5	+2.87	+16.8	+8 54.4	13 22.0	-4 1.4	+0.8401	0.5445	+0.2321	+90	+7	
58	Piscium	5.7	2.86	15.9	11 31.6	16 2.3	-1 26.4	-1.2196	0.5448	0.2294	-33	-78	
75	Piscium	6.3	2.78	15.4	12 31.0	11 1.1	+7 14.4	-0.2218	0.5461	0.2193	+29	-49	
η	Piscium	3.7	2.68	14.2	14 55.3	12 23.1	-5 46.7	-0.2921	0.5484	0.2042	+25	-51	
101	Piscium	6.2	2.66	14.3	14 14.5	14 20.3	-5 53.4	+0.8079	0.5489	0.2014	+90	+9	
105	Piscium	6.1	+2.66	+13.6	+15 59.3	16 5.7	-2 11.6	-0.6476	0.5493	+0.1989	+6	-72	
3	Arietis	6.4	2.64	13.1	17 0.1	19 12.9	+0 49.3	-1.0842	0.5501	0.1941	-23	-73	
4	Arietis	5.8	2.63	13.2	16 32.8	19 56.2	+1 31.1	-0.4732	0.5503	0.1930	+15	-61	
ϵ	Arietis	5.1	2.60	12.7	17 25.0	13 0 3.8	+5 30.1	-0.5942	0.5514	0.1864	+8	-67	
35 B.	Arietis	6.4	2.57	12.4	17 51.5	2 55.0	+8 15.5	-0.5291	0.5521	0.1817	+12	-62	
47 B.	Arietis	6.5	+2.55	+12.4	+17 38.3	4 44.2	+10 1.0	+0.0276	0.5527	+0.1786	+42	-31	
20 H ¹ .	Arietis	6.4	2.55	12.5	16 50.3	5 27.7	+10 42.9	+0.9887	0.5529	0.1773	+90	+23	
15	Arietis	5.9	2.56	11.8	19 6.7	6 0.0	+11 14.1	-1.2840	0.5530	0.1764	-46	-71	
θ	Arietis	5.6	2.53	11.5	19 31.3	9 20.8	-9 32.0	-1.1310	0.5540	0.1705	-28	-70	
26	Arietis	6.2	2.49	11.2	19 29.4	14 54.2	-4 10.2	-0.1816	0.5556	0.1604	+31	-40	
μ	Arietis	5.7	+2.44	+10.7	+19 39.7	20 5.3	+0 50.1	+0.4457	0.5571	+0.1504	+69	-6	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	s	d h m	h m				.	.
47 Arietis	5.8	+2.40	+10.0	+20 20.4	13 259.0	+7 29.3	+0.7256	0.5589	+0.1367	+90	+11
<i>ε</i> Arietis (<i>mean</i>)	4.6	2.40	9.8	21 0.7	3 28.8	+7 58.1	+0.0859	0.5590	0.1357	+46	-23
<i>ζ</i> Arietis	5.0	2.34	9.2	20 44.4	10 20.2	-9 25.1	+1.2555	0.5608	0.1212	+83	+54
66 Arietis	6.1	2.31	8.2	22 31.3	16 12.0	-3 45.7	+0.0487	0.5621	0.1085	+44	-22
16 Tauri	5.4	2.28	7.2	24 1.9	23 15.5	+3 2.6	-0.8426	0.5634	0.0927	-8	-66
17 Tauri	3.8	+2.27	+7.2	+23 51.3	23 17.6	+3 4.6	-0.6527	0.5634	+0.0926	+4	-62
<i>γ</i> Tauri	4.3	2.28	7.1	24 12.6	23 25.9	+3 12.6	-1.0164	0.5634	0.0923	-21	-66
20 Tauri	4.1	2.27	7.1	24 6.7	23 42.0	+3 28.2	-0.8871	0.5635	0.0917	-11	-66
21 Tauri	5.8	2.28	7.1	24 17.9	23 43.9	+3 30.0	-1.0827	0.5635	0.0916	-27	-66
22 Tauri	6.5	2.27	7.1	24 16.3	23 47.6	+3 33.6	-1.0491	0.5635	0.0915	-24	-66
23 Tauri	4.3	+2.27	+7.2	+23 41.6	23 55.3	+3 41.0	-0.4224	0.5635	+0.0912	+17	-47
<i>γ</i> Tauri	3.0	2.26	7.1	23 51.1	14 0 25.2	+4 9.8	-0.5460	0.5636	0.0901	+10	-55
104 B. Tauri	5.5	2.25	7.3	23 10.1	0 48.0	+4 31.7	+0.2129	0.5637	0.0892	+54	-12
27 Tauri	3.7	2.26	7.1	23 48.2	1 8.6	+4 51.7	-0.4295	0.5637	0.0894	+16	-47
28 Tauri	5.2	2.26	7.1	23 53.2	1 9.2	+4 52.2	-0.5174	0.5637	0.0894	+12	-53
33 Tauri	6.0	+2.22	+7.0	+22 56.3	4 33.9	+8 9.6	+0.7794	0.5643	+0.0805	+90	+20
161 B. Tauri	6.5	2.21	6.8	22 58.2	6 14.3	+9 46.3	+0.8772	0.5644	0.0766	+90	+27
36 Tauri	5.6	2.21	6.5	23 52.8	7 41.7	+11 10.7	+0.0170	0.5646	0.0732	+42	-20
<i>χ</i> Tauri	5.3	2.18	5.4	25 26.2	15 30.5	-5 17.5	-1.1442	0.5652	0.0548	-34	-65
62 Tauri	6.1	2.16	5.6	24 6.6	16 8.2	+4 41.0	+0.3067	0.5653	0.0533	+60	-3
95 Tauri	6.2	+2.10	+4.8	+23 56.0	15 0 24.6	+3 17.6	+0.8566	0.5653	+0.0335	+90	+29
315 B. Tauri	6.3	2.07	4.2	24 27.7	6 1.0	+8 41.8	+0.4413	0.5650	0.0200	+70	+7
99 Tauri	6.0	2.06	4.2	23 49.3	6 41.6	+9 21.0	+1.1432	0.5649	0.0184	+90	+51
<i>κ</i> Tauri	5.6	2.07	4.0	24 55.5	6 49.4	+9 28.6	-0.0405	0.5649	0.0180	+38	-18
103 Tauri	5.5	2.04	3.7	24 9.4	11 8.0	-10 22.2	+0.8408	0.5644	+0.0077	+90	+31
118 Tauri	5.4	+2.00	+2.6	+25 5.1	20 17.6	-1 32.2	-0.1884	0.5628	-0.0142	+30	-26
121 Tauri	5.1	1.97	2.5	23 59.2	23 0.1	+1 4.6	+0.9527	0.5622	0.0206	+90	+37
125 Tauri	5.1	1.99	2.0	25 51.1	16 0 50.5	+2 51.0	-1.1080	0.5617	0.0249	-30	-64
132 Tauri	5.0	1.95	1.8	24 32.5	4 55.6	+6 47.4	+0.1897	0.5606	0.0344	+52	-8
412 B. Tauri	5.8	1.93	1.6	24 14.3	8 25.0	+10 9.5	+0.3836	0.5595	0.0425	+66	+2
5 Geminorum	5.9	+1.90	+0.8	+24 26.4	14 52.6	-7 36.5	-0.1561	0.5573	-0.0571	+32	-28
NEW MOON.											
<i>ξ</i> Leonis	5.1	+1.72	-8.0	+11 39.9	20 16 44.4	-8 49.6	-0.2514	0.5075	-0.2082	+27	-51
<i>ο</i> Leonis	3.8	1.72	8.5	10 16.1	21 42.9	-3 59.5	+0.2548	0.5055	0.2119	+55	-24
83 B. Leonis	5.9	+1.75	-9.2	+9 19.5	21 6 1.8	+4 5.4	-0.4825	0.5026	-0.2174	+15	-67
89 B. Leonis	6.2	1.75	9.5	8 42.5	6 57.5	+4 59.5	+0.0003	0.5023	0.2179	+41	-39
<i>π</i> Leonis	4.9	1.75	9.5	8 26.4	8 6.3	+6 6.4	+0.0475	0.5020	0.2186	+43	-36
43 Leonis	6.3	1.80	10.6	6 57.7	20 41.2	-5 39.4	-1.0997	0.4986	0.2246	-22	-83
155 B. Leonis	6.5	1.79	10.8	6 6.8	20 50.1	-5 30.8	-0.1897	0.4986	0.2247	+31	-50
237 B. Leonis	6.3	+1.86	-12.6	+1 27.7	23 13 0.3	+10 13.1	+1.3025	0.4962	-0.2292	+90	+41
55 Leonis	6.1	1.87	12.8	1 10.6	14 56.8	-11 53.6	+1.1741	0.4960	0.2295	+90	+27
<i>ρ</i> ^s Leonis	6.1	1.90	13.2	0 26.6	19 22.8	-7 34.8	+0.9690	0.4958	0.2301	+90	+12
<i>ρ</i> ^s Leonis	5.3	1.94	13.4	+0 22.7	23 1 3.4	-2 3.3	-0.2672	0.4958	0.2304	+27	-56
388 B. Leonis	6.3	1.99	14.1	-1 14.8	8 57.6	+5 37.9	-0.2852	0.4962	0.2301	+26	-57
<i>ε</i> Leonis	5.1	+2.00	-14.5	-2 33.0	10 18.5	+6 56.7	+0.8467	0.4963	-0.2300	+87	+5
431 B. Leonis	6.2	2.04	14.5	1 58.9	14 48.7	+11 19.5	-0.8167	0.4968	0.2294	-3	-90
13 B. Virginis	5.9	2.09	15.6	4 52.6	21 49.3	-5 51.3	+0.7813	0.4981	0.2279	+85	+1
64 B. Virginis	6.5	2.19	16.6	7 19.0	24 8 29.6	+4 31.4	+1.0570	0.5008	0.2245	+83	+18
<i>γ</i> Virginis	5.3	2.32	17.1	8 59.9	21 7.2	-7 12.2	+0.1068	0.5053	0.2183	+44	-35
370 B. Virginis	6.0	+2.45	-17.8	-11 12.2	25 8 0.5	+3 22.3	+0.1815	0.5104	-0.2112	+47	-31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels.	
Name.	Mag.	Red'n's from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
75 Virginis	5.6	+2.73	-18.5	-14 56.5	26 3 46.1	-1 27.4	+0.2412	0.5221	-0.1934	+48	-28
83 Virginis	5.6	2.82	18.5	15 46.0	9 32.6	+4 8.5	+0.0355	0.5261	0.1870	+36	-39
85 Virginis	5.1	2.82	18.3	15 21.4	10 5.1	+4 40.0	-0.5100	0.5265	0.1864	+7	-74
43 H. Virginis	5.5	3.06	18.2	17 49.1	27 0 27.7	-5 24.7	-0.4034	0.5373	0.1675	+10	-66
231 G. Virginis	6.4	3.08	18.2	18 12.3	1 14.5	-4 39.4	-0.1196	0.5379	0.1664	+25	-48
236 G. Virginis	5.7	+3.09	-18.2	-18 20.2	1 59.1	-3 56.3	-0.1017	0.5386	-0.1653	+26	-47
9 G. Libræ	6.5	3.24	18.1	20 4.8	9 30.6	+3 20.4	+0.5606	0.5446	0.1536	+62	-10
17 G. Libræ	6.4	3.33	17.9	20 49.8	14 40.9	+8 20.2	+0.5841	0.5490	0.1449	+63	-8
18 G. Libræ	6.1	3.34	17.8	20 58.9	15 9.1	+8 47.4	+0.6782	0.5493	0.1441	+68	-3
43 B. Libræ	5.7	3.47	18.3	21 2.8	19 42.4	-10 48.7	+0.1083	0.5532	0.1359	+33	-35
47 G. Libræ	6.1	+3.50	-17.0	-21 42.9	23 43.7	-6 55.7	+0.2819	0.5565	-0.1284	+42	-25
64 G. Libræ	5.8	3.58	16.4	22 5.8	28 4 4.8	-2 43.8	+0.1456	0.5602	0.1198	+34	-32
169 B. Libræ	6.0	3.76	15.2	22 52.3	13 16.3	+6 7.8	-0.0555	0.5678	0.1005	+21	-44
177 B. Libræ	6.2	3.77	15.1	22 53.0	13 55.9	+6 46.0	-0.1080	0.5683	0.0990	+18	-47
42 Libræ	5.0	3.79	15.3	23 33.2	14 18.8	+7 8.1	+0.5555	0.5686	0.0982	+56	-10
31 B. Scorpïi	5.4	+3.90	-14.5	-24 17.4	20 0.9	-11 22.5	+0.8002	0.5732	-0.0852	+66	+6
32 B. Scorpïi	5.3	3.89	14.3	23 44.1	20 2.2	-11 21.3	+0.2192	0.5732	0.0852	+34	-28
40 R. Scorpïi	5.4	3.94	14.2	24 35.8	21 57.3	-9 30.5	+0.9567	0.5747	0.0807	+65	+17
50 B. Scorpïi	6.4	3.98	13.7	24 30.1	29 0 9.5	-7 23.2	+0.6851	0.5764	0.0754	+64	-2
57 B. Scorpïi	5.7	3.96	13.2	23 23.1	1 4.6	-6 30.1	-0.5452	0.5770	0.0732	-8	-79
24 G. Scorpïi	6.2	+4.00	-13.3	-24 14.7	1 47.2	-5 49.0	+0.2973	0.5776	-0.0715	+37	-24
27 G. Scorpïi	5.8	3.99	13.0	23 28.1	2 9.2	-5 27.9	-0.5351	0.5779	0.0706	-8	-78
41 G. Scorpïi	6.3	4.04	12.8	24 12.9	4 11.9	-3 29.9	+0.1003	0.5794	0.0655	+26	-35
85 B. Scorpïi	6.0	4.08	13.0	25 16.2	4 38.7	-3 4.1	+1.1665	0.5797	0.0644	+65	+36
19 Scorpïi	4.9	4.08	12.1	23 58.4	6 59.8	-0 48.5	-0.3227	0.5814	0.0585	+3	-61
σ Scorpïi	3.1	+4.12	-12.5	-25 23.9	7 12.0	-0 36.7	+1.1399	0.5815	-0.0580	+65	+34
ρ Ophiuchi	4.7	4.09	11.4	23 15.6	9 0.4	+1 7.5	-1.1727	0.5827	0.0534	-52	-90
22 Scorpïi	4.8	4.17	11.6	24 56.2	10 50.7	+2 53.6	+0.4662	0.5839	0.0487	+46	-14
126 B. Scorpïi	6.1	4.22	10.3	24 18.6	15 24.6	+7 16.8	-0.3742	0.5869	0.0368	-2	-65
88 B. Ophiuchi	6.3	4.35	8.7	24 58.2	22 39.2	-9 45.8	+0.1070	0.5910	0.0172	+22	-35
26 Ophiuchi	5.8	+4.35	-8.7	-24 51.9	22 43.8	-9 41.3	-0.0005	0.5910	-0.0170	+16	-41
137 B. Ophiuchi	6.3	4.42	7.5	25 9.3	3 27.1	-5 9.3	+0.2460	0.5934	0.0039	+28	-27
39 Ophiuchi	5.1	4.42	6.6	24 12.0	5 43.0	-2 58.9	-0.7306	0.5944	+0.0024	-24	-90
θ Ophiuchi	3.4	4.47	6.4	24 55.2	7 15.3	-1 30.3	+0.0105	0.5950	0.0068	+15	-40
191 B. Ophiuchi	6.3	4.46	5.9	24 10.2	8 27.8	-0 20.7	-0.7415	0.5955	0.0102	-24	-90
δ Ophiuchi	4.3	+4.46	-5.8	-24 6.1	8 57.4	+0 7.7	-0.8055	0.5957	+0.0116	-28	-90
136 G. Ophiuchi	6.3	4.52	6.1	25 52.4	9 8.6	+0 18.5	+0.9973	0.5957	0.0121	+64	+20
51 Ophiuchi	4.8	4.48	5.2	23 54.1	10 54.6	+2 0.2	-0.9805	0.5964	0.0171	-39	-90
63 Ophiuchi	6.1	4.61	2.8	24 52.3	19 55.6	+10 39.2	+0.2759	0.5990	0.0429	+33	-25
4 Sagittarii	4.8	4.60	2.1	23 48.6	21 48.9	-11 32.1	-0.7097	0.5993	0.0483	-20	-90
7 Sagittarii	5.5	+4.63	-1.8	-24 17.0	22 58.7	-10 25.1	-0.1745	0.5996	+0.0516	+10	-51
9 Sagittarii	6.0	4.63	1.7	24 21.8	23 22.1	-10 2.8	-0.0727	0.5996	0.0528	+15	-45
1 Sagittarii	5.2	4.64	-0.7	23 43.2	2 22.6	-7 9.6	-0.5491	0.6000	0.0614	-9	-79
70 B. Sagittarii	6.4	4.72	+0.1	24 57.2	6 6.2	-3 35.2	+0.9386	0.6003	0.0720	+65	+16
24 Sagittarii	5.7	4.72	1.7	24 5.7	10 50.3	+0 57.3	+0.4487	0.6004	0.0853	+48	-15
117 B. Sagittarii	5.8	+4.72	+2.3	-23 34.6	12 36.6	+2 39.3	+0.0851	0.6004	+0.0903	+27	-36
26 Sagittarii	6.1	4.74	2.6	23 54.7	13 53.0	+3 52.5	+0.5368	0.6003	0.0938	+54	-11
28 Sagittarii	5.6	4.70	3.4	22 28.7	15 37.1	+5 32.4	-0.7262	0.6002	0.0986	-16	-90
30 Sagittarii	6.2	4.70	3.9	22 15.4	17 20.6	+7 11.6	-0.7729	0.6001	0.1034	-18	-90
γ ¹ Sagittarii	5.0	4.73	4.2	22 50.8	18 36.5	+8 24.5	-0.0515	0.5999	0.1068	+21	-44
γ ² Sagittarii	5.1	+4.73	+4.3	-22 46.5	18 58.2	+8 45.2	-0.0847	0.5998	+0.1078	+19	-46

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	r'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
154 B. Sagittarii	5.9	+4.75	+ 4.3	-23 16.8	31 19 18.5	+ 9 4.7	+0.4546	0.5997	+0.1087	+50	-15	
168 B. Sagittarii	0.3	4.74	5.0	22 48.7	21 28.1	+11 9.0	+0.2299	0.5994	0.1145	+37	-28	
o Sagittarii	3.9	+4.72	+ 5.5	-21 51.8	22 39.0	-11 43.0	-0.5771	0.5992	+0.1177	- 5	-81	

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191 B. Sagittarii	6.5	+4.78	+ 5.8	-23 19.2	1 0 11.5	-10 14.2	+1.0569	0.5990	+0.1218	+67	+24
π Sagittarii	3.0	4.71	6.2	21 9.3	0 36.8	- 9 49.9	-1.0435	0.5988	0.1229	-34	-90
199 B. Sagittarii	6.4	4.73	6.4	21 47.7	1 38.6	- 8 50.6	-0.2791	0.5986	0.1256	+11	-58
222 B. Sagittarii	5.5	4.77	7.2	22 33.4	4 46.9	- 5 49.9	+0.8821	0.5979	0.1337	+67	+10
50 Sagittarii	5.5	+4.75	+ 7.9	-21 56.4	6 59.0	- 3 43.2	+0.5714	0.5973	+0.1393	+60	- 9
253 B. Sagittarii	5.0	4.64	14.8	21 29.0	8 45.8	- 2 0.8	+0.3711	0.5967	0.1438	+48	-20
f Sagittarii	5.1	4.70	10.3	19 57.5	14 47.9	+ 3 46.8	-0.2243	0.5947	0.1584	+17	-54
57 Sagittarii	6.0	4.69	11.0	19 15.2	17 5.0	+ 5 58.4	-0.5519	0.5939	0.1638	+ 1	-78
π Capricorni	5.2	4.65	14.6	18 28.8	2 65.4	- 4 41.0	+1.1725	0.5878	0.1934	+72	+32
31 B. Capricorni	6.4	+4.59	+14.9	-16 0.8	7 33.8	- 4 7.1	-1.1374	0.5876	+0.1946	-34	-90
ρ Capricorni	5.0	4.64	14.8	18 5.1	7 35.7	- 4 5.3	+0.9042	0.5875	0.1947	+72	+10
47 B. Capricorni	6.2	4.61	15.5	16 48.4	10 17.0	- 1 30.2	+0.1795	0.5862	0.1998	+43	-31
τ Capricorni	5.2	4.56	15.9	15 14.5	11 48.3	- 0 2.5	-1.0506	0.5855	0.2026	-26	-90
61 B. Capricorni	5.9	4.58	16.0	16 24.9	12 18.4	+ 0 26.4	+0.2031	0.5852	0.2035	+44	-30
95 B. Capricorni	5.9	+4.53	+17.6	-14 48.0	19 41.4	+ 7 32.4	+0.1672	0.5815	+0.2160	+45	-32
53 B. Aquarii	6.5	4.47	19.0	13 32.5	3 24.8	- 9 36.7	+0.5106	0.5779	0.2266	+66	-13
18 Aquarii	5.5	4.45	19.7	13 13.8	6 12.2	- 6 20.5	+0.9830	0.5762	0.2312	+77	+14
72 B. Aquarii	6.5	4.41	20.0	11 55.4	7 54.0	- 4 42.6	+0.0971	0.5753	0.2333	+42	-35
137 B. Capricorni	6.2	4.37	20.7	10 56.7	12 36.8	- 0 10.2	+0.2526	0.5730	0.2388	+52	-27
c ¹ Capricorni	5.3	+4.33	+21.0	- 9 27.5	14 57.4	+ 2 5.2	-0.6408	0.5718	+0.2412	+ 4	-84
c ² Capricorni	6.3	4.33	21.1	9 39.2	15 29.4	+ 2 36.0	-0.3207	0.5716	0.2418	+21	-59
30 Aquarii	5.6	4.25	21.9	6 55.1	22 43.8	+ 9 34.5	-1.2264	0.5682	0.2483	-35	-90
44 Aquarii	5.7	4.20	22.6	5 47.7	4 40.5	- 8 41.6	-0.8387	0.5657	0.2524	- 5	-90
51 Aquarii	5.8	4.17	22.8	5 15.1	7 42.1	- 5 46.6	-0.6069	0.5644	0.2541	+ 8	-80
κ Aquarii	5.2	+4.12	+23.3	- 4 39.0	13 38.0	- 0 3.4	+0.3181	0.5622	+0.2566	+58	-24
207 B. Aquarii	6.3	4.11	23.4	3 58.8	14 57.8	+ 1 13.6	+0.0005	0.5617	0.2571	+40	-41
6 G. Piscium	6.2	4.05	23.9	2 50.0	22 37.4	+ 8 36.9	+0.8501	0.5592	0.2586	+87	+ 5
22 B. Piscium	6.4	3.95	24.2	- 0 9.5	5 9 48.6	- 4 35.2	+1.1049	0.5564	0.2579	+90	+22
κ Piscium	4.9	3.93	24.0	+ 0 48.5	11 19.4	- 3 7.5	+0.5402	0.5561	0.2575	+75	-12
9 Piscium	6.4	+3.93	+24.0	+ 0 40.4	11 27.9	- 2 59.4	+0.7097	0.5560	+0.2575	+90	- 3
16 Piscium	5.7	3.89	24.0	1 38.9	15 32.6	+ 0 56.9	+0.7931	0.5553	0.2562	+90	+ 2
19 Piscium	5.4	3.86	23.8	3 2.0	20 0.3	+ 5 15.3	+0.5598	0.5546	0.2544	+76	-11
ω Piscium	4.0	3.82	23.0	6 24.6	6 1 46.6	+10 49.6	-1.3416	0.5540	0.2512	-46	-81
36 Piscium	6.2	3.76	22.8	7 47.2	9 30.4	- 5 42.6	-0.7970	0.5535	0.2457	- 2	-82
d Piscium	5.4	+3.74	+22.8	+ 7 44.1	11 18.7	- 3 58.0	-0.3053	0.5534	+0.2442	+25	-57
136 B. Piscium	6.5	3.67	22.2	8 54.5	20 32.2	+ 4 56.4	+0.7331	0.5535	0.2355	+90	+ 1
58 Piscium	5.7	3.67	21.4	11 31.6	23 7.6	+ 7 26.4	-1.2976	0.5536	0.2327	-42	-78
75 Piscium	6.3	3.61	20.7	12 31.0	7 7 50.8	- 8 8.5	-0.3176	0.5543	0.2222	+24	-54
η Piscium	3.7	3.54	19.3	14 55.4	18 54.6	+ 2 32.3	-0.3903	0.5556	0.2067	+20	-57
101 Piscium	6.2	+3.52	+19.4	+14 14.6	20 49.0	+ 4 22.7	+0.6955	0.5559	+0.2038	+90	+ 2
105 Piscium	6.1	3.52	18.7	15 59.4	22 31.8	+ 6 1.9	-0.7422	0.5561	0.2011	- 0	-74
3 Arietis	6.4	3.51	18.1	17 0.2	8 1 34.5	+ 8 58.4	-1.1743	0.5566	0.1962	-31	-73
4 Arietis	5.8	3.50	18.2	16 32.9	2 16.9	+ 9 39.3	-0.5707	0.5567	0.1951	+10	-67
ι Arietis	5.1	3.47	17.6	17 25.1	6 18.9	-10 27.3	-0.6910	0.5574	0.1883	+ 3	-72
35 B. Arietis	6.4	+3.46	+17.2	+17 51.6	9 6.6	- 7 45.4	-0.6271	0.5579	+0.1834	+ 7	-69

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallax	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>l'</i>	<i>r'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
47 B. Arietis	6.5	+3.44	+17.1	+17 38.4	8 10 53.4	- 6 2.4	-0.0768	0.5582	+0.1803	+37	-37
20 H ¹ . Arietis	6.4	3.43	17.2	16 50.4	11 36.1	- 5 21.2	+0.8739	0.5584	0.1790	+90	+15
θ Arietis	5.6	3.42	16.0	19 31.3	15 24.8	- 1 40.6	-1.2236	0.5590	0.1720	-38	-70
26 Arietis	6.2	3.38	15.4	19 29.5	20 52.3	+ 3 35.4	-0.2841	0.5600	0.1616	+25	-46
μ Arietis	5.7	3.34	14.8	19 39.8	9 1 58.4	+ 8 30.6	+0.3377	0.5609	0.1515	+61	-11
47 Arietis	5.8	+3.30	+13.8	+20 20.4	8 46.3	- 8 56.1	+0.6165	0.5620	+0.1375	+85	+ 5
ε Arietis (<i>mean</i>)	4.6	3.29	13.6	21 0.8	9 15.7	- 8 27.7	-0.0180	0.5621	0.1365	+40	-28
ζ Arietis	5.0	3.23	12.8	20 44.5	16 2.4	- 1 55.6	+1.1444	0.5630	0.1219	+90	+42
66 Arietis	6.1	3.21	11.4	22 31.3	21 50.8	+ 3 40.4	-0.0525	0.5638	0.1090	+38	-27
16 Tauri	5.4	3.17	10.0	24 1.9	10 4 51.3	+10 25.8	-0.9373	0.5644	0.0931	-15	-66
17 Tauri	3.8	+3.17	+10.0	+23 51.4	4 53.3	+10 27.7	-0.7484	0.5644	+0.0931	- 2	-66
q Tauri	4.3	3.17	9.9	24 12.6	5 1.5	+10 35.6	-1.1102	0.5644	0.0928	-30	-66
20 Tauri	4.1	3.17	9.9	24 6.7	5 17.6	+10 51.2	-0.9815	0.5644	0.0921	-18	-66
21 Tauri	5.8	3.17	9.8	24 17.9	5 19.5	+10 53.0	-1.1760	0.5644	0.0921	-37	-66
22 Tauri	6.5	3.17	9.8	24 16.4	5 23.1	+10 56.4	-1.1426	0.5644	0.0919	-33	-66
23 Tauri	4.3	+3.16	+10.0	+23 41.6	5 30.8	+11 3.9	-0.5191	0.5644	+0.0916	+12	-53
7 Tauri	3.0	3.16	9.9	23 51.1	6 0.5	+11 32.5	-0.6419	0.5645	0.0905	+ 4	-62
104 B. Tauri	5.5	3.14	10.1	23 10.2	6 23.2	+11 54.3	+0.1131	0.5645	0.0896	+47	-17
27 Tauri	3.7	3.15	9.8	23 48.2	6 43.7	-11 45.9	-0.5259	0.5645	0.0888	+11	-53
28 Tauri	5.2	3.15	9.8	23 53.2	6 44.3	-11 45.3	-0.6134	0.5645	0.0888	+ 6	-59
33 Tauri	6.0	+3.10	+ 9.7	+22 56.3	10 7.9	- 8 29.0	+0.6782	0.5646	+0.0809	+90	+14
161 B. Tauri	6.5	3.09	9.4	22 58.2	11 47.8	- 6 52.7	+0.7763	0.5647	0.0770	+90	+20
36 Tauri	5.6	3.09	8.9	23 52.8	13 14.9	- 5 28.7	-0.0795	0.5647	0.0736	+36	-25
χ Tauri	5.3	3.05	7.3	25 26.2	21 2.5	+ 2 1.9	-1.2341	0.5646	0.0552	-47	-65
62 Tauri	6.1	3.02	7.6	24 6.6	21 40.1	+ 2 38.3	+0.2124	0.5646	0.0637	+54	- 8
95 Tauri	6.2	+2.94	+ 6.5	+23 56.1	11 5 56.3	+10 36.5	+0.7648	0.5640	+0.0339	+90	+24
315 B. Tauri	6.3	2.90	5.5	24 27.7	11 33.0	- 7 58.9	+0.3534	0.5634	0.0205	+63	+ 2
99 Tauri	6.0	2.88	5.6	23 49.3	12 13.8	- 7 19.6	+1.0545	0.5632	0.0188	+90	+44
k Tauri	5.6	2.90	5.2	24 55.5	12 21.6	- 7 12.0	-0.1272	0.5632	0.0185	+33	-23
103 Tauri	5.5	2.84	4.9	24 9.5	16 40.8	- 3 2.1	+0.7552	0.5625	+0.0082	+90	+26
118 Tauri	5.4	+2.78	+ 3.3	+25 5.1	12 1 52.4	+ 5 50.0	-0.2678	0.5604	-0.0135	+25	-31
121 Tauri	5.1	2.73	3.2	23 59.2	4 35.7	+ 8 27.6	+0.8747	0.5597	0.0199	+90	+32
125 Tauri	5.1	2.75	2.4	25 51.1	6 26.6	+10 14.6	-1.1845	0.5591	0.0241	-40	-64
132 Tauri	5.0	2.68	2.2	24 32.5	10 33.0	- 9 47.8	+0.1159	0.5579	0.0336	+48	-12
412 B. Tauri	5.8	2.65	1.8	24 14.3	14 3.5	- 6 24.6	+0.3122	0.5568	0.0416	+60	- 2
1 Geminorum	4.3	+2.60	+ 1.6	+23 16.2	17 16.1	- 3 18.7	+1.2215	0.5556	-0.0487	+85	+57
3 Geminorum	5.6	2.58	1.3	23 7.7	19 46.4	- 0 53.5	+1.2465	0.5547	0.0543	+81	+60
5 Geminorum	5.9	2.60	0.8	24 26.4	20 33.5	- 0 8.1	-0.2233	0.5544	0.0560	+28	-32
8 Geminorum	6.1	2.57	0.7	23 59.9	22 42.5	+ 1 56.4	+0.1321	0.5536	0.0607	+49	-13
9 Geminorum	6.2	2.56	0.7	23 46.2	23 0.5	+ 2 13.8	+0.3618	0.5534	0.0614	+64	- 1
36 B. Geminorum	6.0	+2.52	+ 0.3	+23 22.5	2 52.6	+ 5 58.1	+0.5402	0.5519	-0.0697	+78	+ 7
52 B. Geminorum	6.5	2.50	- 0.7	24 39.6	8 15.6	+11 10.0	-1.2705	0.5496	0.0811	-54	-65
d Geminorum	5.2	2.40	0.9	21 51.6	14 46.5	- 6 32.3	+1.2212	0.5466	0.0943	+87	+53
87 B. Geminorum	5.8	2.43	1.4	23 42.0	14 57.1	- 6 22.0	-0.8109	0.5465	0.0947	- 6	-66
MARS	1.7	...	...	23 34.5	15 59.9	+ 5 21.4	-0.7754	0.5166	0.0949	- 4	-66
44 Geminorum	5.9	+2.37	- 1.9	+22 45.7	21 8.6	- 0 22.9	-0.4076	0.5434	-0.1068	+18	-47
120 B. Geminorum	6.5	2.33	2.2	21 23.5	23 25.5	+ 1 49.5	+0.8476	0.5423	0.1111	+90	+21
δ Geminorum	3.5	2.31	2.7	22 8.1	4 7.3	+ 6 22.1	-0.5109	0.5400	0.1197	-12	-55
56 Geminorum	5.2	2.27	2.5	20 36.0	5 0.8	+ 7 13.7	+1.0690	0.5395	0.1213	+90	+35
149 B. Geminorum	6.4	2.27	3.0	21 42.1	7 19.9	+ 9 28.4	-0.4279	0.5383	0.1255	+17	-51
61 Geminorum	5.8	+2.26	- 2.7	+20 25.4	7 23.1	+ 9 31.5	+0.9714	0.5383	-0.1256	+90	+27

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y'</i>	<i>r'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
63 Geminorum	5.3	+2.28	-3.0	+21 36.9	14	7	45.0	+ 9 52.7	-0.3856	0.5381	-0.1263	+19	-48
79 Geminorum	6.3	2.21	3.7	20 30.9	16	8.5	- 5 59.8	-0.2944	0.5338	0.1405	+24	-45	
209 B. Geminorum	6.2	2.17	4.0	19 32.2	19	27.9	- 2 46.8	+0.3082	0.5320	0.1458	+59	-13	
85 Geminorum	5.2	2.17	4.2	20 6.2	21	16.4	- 1 1.7	-0.5822	0.5311	0.1487	+ 8	-63	
217 B. Geminorum	6.3	2.16	4.5	20 2.6	23	47.8	+ 1 25.0	-0.8970	0.5297	0.1526	-11	-70	
10 H. Cancrī	6.1	+2.13	-4.6	+19 4.6	15	1	46.0	+ 3 19.6	-0.1322	0.5287	-0.1555	+33	-37
ζ Cancrī (mean)	4.7	2.10	4.8	17 53.9	5	29.0	+ 6 55.7	+0.5821	0.5268	0.1610	+81	0	
NEW MOON.													
<i>p</i> ^s Leonis	5.3	+1.87	-12.2	+ 0 22.7	19	7	7.3	+ 5 48.1	-0.1579	0.4975	-0.2300	+32	-49
388 B. Leonis	6.3	+1.89	-12.8	- 1 14.8	15	0.7	-10 31.4	-0.1666	0.4978	-0.2297	+32	-50	
<i>e</i> Leonis	5.1	1.89	13.0	2 32.9	16	21.6	- 9 12.7	+0.9694	0.4979	0.2296	+87	+13	
431 B. Leonis	6.2	1.92	13.1	1 58.8	20	51.6	- 4 50.1	-0.6928	0.4984	0.2289	+ 4	-89	
13 B. Virginis	5.9	1.94	13.8	4 52.5	20	3	52.1	+ 1 58.9	+0.9171	0.4994	0.2274	+85	+ 9
64 B. Virginis	6.5	2.00	14.6	7 19.0	14	33.2	-11 37.6	+1.2053	0.5017	0.2238	+83	+31	
<i>g</i> Virginis	5.3	+2.09	-15.2	- 8 59.9	21	3	13.2	+ 0 41.1	+0.2634	0.5056	-0.2175	+53	-27
370 B. Virginis	6.0	2.19	15.8	11 12.2	14	10.3	+11 19.5	+0.3471	0.5099	0.2101	+57	-22	
75 Virginis	5.6	2.42	16.5	14 56.5	23	10	7.5	+ 6 41.6	+0.4190	0.5200	0.1920	+58	-18
83 Virginis	5.6	2.49	16.5	15 46.0	15	58.7	-11 37.9	+0.2143	0.5234	0.1854	+46	-29	
85 Virginis	6.1	2.50	16.4	15 21.3	16	31.7	-11 5.9	-0.3355	0.5237	0.1848	+16	-60	
43 H. Virginis	5.5	+2.70	-16.4	-17 49.1	23	7	8.6	+ 3 3.7	-0.2248	0.5331	-0.1658	+20	-54
231 G. Virginis	6.4	2.72	16.4	18 12.3	7	56.3	+ 3 49.9	+0.0619	0.5336	0.1647	+34	-37	
236 G. Virginis	5.7	2.73	16.4	18 20.2	8	41.8	+ 4 33.9	+0.0801	0.5341	0.1636	+35	-36	
9 G. Libræ	6.5	2.86	16.4	20 4.8	16	22.6	+11 59.8	+0.7503	0.5394	0.1518	+70	+ 2	
17 G. Libræ	6.4	2.95	16.3	20 49.8	21	39.8	- 6 53.3	+0.7744	0.5432	0.1432	+69	+ 3	
18 G. Libræ	6.1	+2.96	-16.2	-20 58.9	22	8.6	- 6 25.6	+0.8697	0.5436	-0.1424	+69	+ 9	
43 B. Libræ	5.7	3.08	16.9	21 2.8	24	2	48.5	- 1 54.9	+0.2931	0.5469	0.1342	+44	-24
47 G. Libræ	6.1	3.12	15.6	21 42.8	6	55.8	+ 2 4.1	+0.4684	0.5499	0.1268	+53	-15	
64 G. Libræ	5.8	3.19	15.1	22 5.8	11	23.8	+ 6 22.9	+0.3297	0.5531	0.1183	+44	-22	
169 B. Libræ	6.0	3.36	14.2	22 52.3	20	50.6	- 8 30.2	+0.1238	0.5599	0.0992	+30	-34	
177 B. Libræ	6.2	+3.37	-14.1	-22 53.0	21	31.3	- 7 50.9	+0.0702	0.5604	-0.0978	+27	-37	
42 Libræ	5.0	3.39	14.3	23 33.2	21	54.9	- 7 28.1	+0.7425	0.5606	0.0969	+66	+ 2	
31 B. Scorpī	5.4	3.51	13.6	24 17.4	25	3	47.2	- 1 48.5	+0.9885	0.5647	0.0841	+66	+19
32 B. Scorpī	5.3	3.50	13.4	23 44.1	3	48.5	- 1 47.2	+0.3996	0.5647	0.0841	+45	-18	
40 B. Scorpī	5.4	3.55	13.4	24 35.8	5	47.1	+ 0 7.1	+1.1466	0.5662	0.0797	+65	+34	
δ Scorpī	2.5	+3.51	-12.5	-22 23.4	6	33.8	+ 0 52.1	-1.2439	0.5666	-0.0779	-57	-83	
50 B. Scorpī	6.4	3.59	13.0	24 30.1	8	3.4	+ 2 18.4	+0.8704	0.5676	0.0745	+65	+11	
57 B. Scorpī	5.7	3.58	12.4	23 23.0	9	0.2	+ 3 13.2	-0.3776	0.5682	0.0723	+1	-65	
24 G. Scorpī	6.2	3.61	12.6	24 14.7	9	44.2	+ 3 55.6	+0.4764	0.5687	0.0706	+49	-14	
27 G. Scorpī	5.8	3.60	12.3	23 28.1	10	6.8	+ 4 17.4	-0.3678	0.5689	0.0698	+ 2	-64	
41 G. Scorpī	6.3	+3.65	-12.2	-24 12.8	12	13.3	+ 6 19.2	+0.2755	0.5703	-0.0648	+36	-25	
19 Scorpī	4.9	3.70	11.5	23 58.4	15	6.6	+ 9 6.1	-0.1550	0.5721	0.0580	+11	-50	
ρ Ophiuchi	4.7	3.71	10.9	23 15.6	17	11.0	+11 5.9	-1.0182	0.5734	0.0530	-39	-90	
22 Scorpī	4.8	3.79	11.1	24 56.2	19	4.9	-11 4.5	+0.6429	0.5745	0.0483	+59	- 4	
126 B. Scorpī	6.1	3.85	9.9	24 18.6	23	47.8	- 6 32.2	-0.2123	0.5771	0.0366	+ 6	-54	
88 B. Ophiuchi	6.3	+4.00	- 8.6	-24 58.2	26	7	16.7	+ 0 39.7	+0.2708	0.5810	-0.0175	+31	-25
26 Ophiuchi	5.8	4.00	8.5	24 51.9	7	21.4	+ 0 44.2	+0.1617	0.5810	0.0173	+25	-31	
137 B. Ophiuchi	6.3	4.09	7.5	25 9.3	12	14.1	+ 5 25.6	+0.4082	0.5833	-0.0045	+39	-17	
39 Ophiuchi	5.1	4.09	6.6	24 12.0	14	34.4	+ 7 40.5	-0.5842	0.5843	+0.0017	-16	-83	
θ Ophiuchi	3.4	4.14	6.5	24 55.2	16	9.8	+ 9 12.2	+0.1662	0.5849	0.0059	+24	-31	
191 B. Ophiuchi	6.3	+4.14	- 5.9	-24 10.2	17	24.8	+10 24.3	-0.5975	0.5854	+0.0093	-16	-85	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		$^{\circ}$	$'$	$^{\circ}$	d	h	m	$^{\circ}$	$'$	$^{\circ}$	$'$	
b Ophiuchi	4.3	+4.14	-5.9	-24 6.1	26	17	55.3	+10 53.5	-0.6629	0.5856	+0.0106	-20 -90
136 G. Ophiuchi	6.3	4.20	6.3	25 52.4	18	6.9	+11 4.7	+1.1654	0.5856	0.0111	+64 +37	
51 Ophiuchi	4.8	4.16	5.2	23 54.1	19	56.3	-11 10.1	-0.8420	0.5863	0.0161	-30 -90	
63 Ophiuchi	6.1	4.33	3.2	24 52.4	27	5 14.9	-2 13.5	+0.4235	0.5890	0.0413	+43 -16	
4 Sagittarii	4.8	4.32	2.4	23 48.6		7 11.8	-0 21.2	-0.5774	0.5895	0.0466	-12 -82	
7 Sagittarii	5.5	+4.36	-2.2	-24 17.0		8 23.8	+0 48.0	-0.0361	0.5897	+0.0498	+17 -43	
9 Sagittarii	6.0	4.36	2.0	24 21.8		8 47.9	+1 11.0	+0.0667	0.5898	0.0509	+22 -37	
1 Sagittarii	5.2	4.39	1.1	23 43.2		11 54.2	+4 10.1	-0.4193	0.5904	0.0594	-2 -68	
70 B. Sagittarii	6.4	4.48	-0.4	24 57.2		15 44.6	+7 51.3	+1.0839	0.5909	0.0698	+65 +28	
24 Sagittarii	5.7	4.51	+1.2	24 5.7		20 37.1	-11 27.8	+0.5818	0.5912	0.0828	+57 -8	
117 B. Sagittarii	5.8	+4.51	+1.8	-23 34.6		22 26.5	-9 42.7	+0.2115	0.5914	+0.0877	+34 -29	
26 Sagittarii	6.1	4.54	2.1	23 54.7		23 45.1	-8 27.3	+0.6672	0.5914	0.0912	+63 -3	
28 Sagittarii	5.6	4.51	3.0	22 28.7	28	1 32.1	-6 44.5	-0.6133	0.5914	0.0953	-9 -86	
30 Sagittarii	6.2	4.52	3.6	22 15.4		3 18.5	+5 2.4	-0.6625	0.5914	0.1006	-12 -90	
γ^1 Sagittarii	5.0	4.56	3.8	22 50.8		4 36.5	-3 47.4	+0.0658	0.5914	0.1040	+27 -37	
γ^2 Sagittarii	5.1	+4.56	+3.9	-22 46.5		4 58.7	-3 26.2	+0.0317	0.5913	+0.1050	+25 -39	
154 B. Sagittarii	5.9	4.58	3.8	23 16.8		5 19.6	-3 6.2	+0.5768	0.5913	0.1059	+58 -8	
168 B. Sagittarii	6.3	4.58	4.6	22 48.7		7 32.6	-0 58.4	+0.3465	0.5912	0.1116	+44 -21	
σ Sagittarii	3.9	4.57	5.1	21 51.8		8 45.4	+0 11.5	-0.4711	0.5911	0.1147	0 -72	
191 B. Sagittarii	6.5	4.63	5.2	23 19.2		10 20.2	+1 42.6	+1.1788	0.5910	0.1188	+67 +37	
π Sagittarii	3.0	+4.56	+5.9	-21 9.3		10 46.2	+2 7.6	-0.9451	0.5909	+0.1199	-27 -90	
199 B. Sagittarii	6.4	4.59	6.0	21 47.7		11 49.5	+3 8.3	-0.1737	0.5908	0.1226	+16 -51	
222 B. Sagittarii	5.5	4.64	6.7	22 33.4		15 2.4	+6 13.7	+0.9951	0.5904	0.1306	+67 +19	
50 Sagittarii	5.5	4.64	7.5	21 56.4		17 17.6	+8 23.5	+0.6776	0.5901	0.1361	+67 -3	
253 B. Sagittarii	6.1	4.64	8.1	21 29.0		19 6.9	+10 8.4	+0.4726	0.5897	0.1406	+54 -14	
f Sagittarii	5.1	+4.63	+10.1	-19 57.5	29	1 16.6	-7 56.3	-0.1375	0.5885	+0.1552	+21 -49	
57 Sagittarii	6.0	4.63	10.9	19 15.2		3 36.4	-5 42.0	-0.4714	0.5879	0.1605	+5 -71	
π Capricorni	5.2	4.68	14.7	18 28.8		17 43.1	+7 51.8	+1.2407	0.5839	0.1903	+72 +39	
31 B. Capricorni	6.4	4.62	15.3	16 0.8		18 19.0	+8 26.4	-1.0832	0.5837	0.1915	-30 -90	
ρ Capricorni	5.0	4.67	14.9	18 5.1		18 20.8	+8 28.2	+0.9696	0.5837	0.1915	+72 +15	
47 B. Capricorni	6.2	+4.65	+15.8	-16 48.4		21 4.0	+11 5.1	+0.2359	0.5828	+0.1968	+46 -28	
τ Capricorni	5.2	4.61	16.4	15 14.5		22 36.3	-11 26.2	-1.0028	0.5823	0.1996	-23 -90	
61 B. Capricorni	5.9	4.64	16.4	16 24.9		23 6.8	-10 56.9	+0.2558	0.5822	0.2006	+47 -27	
95 B. Capricorni	5.9	4.63	18.3	14 48.0	30	6 33.4	-3 47.3	+0.2056	0.5796	0.2134	+46 -29	
53 B. Aquarii	6.5	4.61	20.0	13 32.5		13 42.3	+3 5.5	+0.5352	0.5771	0.2244	+67 -12	
18 Aquarii	5.5	+4.61	+20.7	-13 13.8		17 6.6	+6 22.1	+1.0009	0.5760	+0.2291	+77 +16	
72 B. Aquarii	6.5	4.58	21.2	11 55.3		18 48.4	+8 0.1	+0.1108	0.5754	0.2313	+43 -35	
137 B. Capricorni	6.2	4.56	22.1	10 56.7		23 31.0	-11 27.8	+0.2565	0.5739	0.2371	+52 -27	
c^1 Capricorni	5.3	4.54	22.6	9 27.5	31	1 51.2	-9 12.8	-0.6410	0.5732	0.2397	+4 -84	
c^2 Capricorni	6.3	4.54	22.7	9 39.2		2 23.1	-8 42.0	-0.3223	0.5730	0.2403	+21 -59	
30 Aquarii	5.6	+4.50	+24.0	-6 55.0		9 35.2	-1 45.8	-1.2401	0.5708	+0.2473	-36 -90	
44 Aquarii	5.7	4.48	24.9	5 47.7		15 28.8	+3 54.7	-0.8649	0.5691	0.2518	-7 -90	
51 Aquarii	5.8	+4.47	+25.3	-5 15.0		18 28.4	+6 47.9	-0.6400	0.5683	+0.2537	+6 -84	

SEPTEMBER.

κ Aquarii	5.2	+4.45	+25.9	-4 39.0	1	0	19.7	-11 33.4	+0.2678	0.5669	+0.2567	+55 -26
207 B. Aquarii	6.3	4.45	26.1	3 58.7		1	38.3	-10 17.7	-0.0506	0.5667	0.2573	+37 -43
6 G. Piscium	6.2	4.42	26.8	2 50.0		9	10.4	-3 1.9	+0.7767	0.5653	0.2593	+87 +1
22 B. Piscium	6.4	4.38	27.5	-0 9.4		20	7.8	+7 32.1	+1.0047	0.5637	0.2593	+90 +15
κ Piscium	4.9	+4.37	+27.4	+0 48.5		21	36.6	+8 57.6	+0.4423	0.5636	+0.2590	+67 -17

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	r'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
9 Piscium	6.4	+4.37	+27.5	0 40.5	1 21 44.8	+ 9 5.6	+0.6098	0.5636	+0.2590	+81	- 8
16 Piscium	5.7	4.35	27.7	1 39.0	2 1 43.7	-11 3.9	+0.6840	0.5632	0.2580	+88	- 4
19 Piscium	5.4	4.34	27.6	3 2.0	6 4.8	- 6 52.1	+0.4444	0.5630	0.2563	+67	-17
36 Piscium	6.2	4.30	27.1	7 47.2	19 12.4	+ 5 47.5	-0.9197	0.5629	0.2482	-10	-82
d Piscium	5.4	4.30	27.1	7 44.2	20 57.5	+ 7 28.8	-0.4374	0.5630	0.2467	+17	-65
136 B. Piscium	6.5	+4.27	+26.6	8 54.6	3 5 54.1	- 7 53.7	+0.5723	0.5636	+0.2381	+78	- 8
75 Piscium	6.3	4.26	25.4	12 31.1	16 51.0	+ 2 39.7	-0.4793	0.5647	0.2250	+15	-65
7 Piscium	3.7	4.24	24.0	14 55.5	4 3 33.2	-11 1.2	-0.5641	0.5661	0.2093	-10	-68
101 Piscium	6.2	4.22	24.0	14 14.7	5 23.8	- 9 14.6	+0.5030	0.5664	0.2064	+73	- 8
105 Piscium	6.1	4.24	23.4	15 59.5	7 3.2	- 7 38.8	-0.9144	0.5666	0.2037	-11	-74
3 Arietis	6.4	+4.24	+22.8	17 0.2	10 0.0	- 4 48.5	-1.3429	0.5671	+0.1988	-59	-68
4 Arietis	5.8	4.23	22.8	16 33.0	10 41.0	- 4 8.8	-0.7493	0.5671	0.1976	- 1	-74
2 Arietis	5.1	4.22	22.2	17 25.1	14 35.2	- 0 23.2	-0.8715	0.5677	0.1908	- 8	-73
35 B. Arietis	6.4	4.21	21.7	17 51.7	17 17.4	+ 2 13.1	-0.8111	0.5681	0.1858	- 5	-72
47 B. Arietis	6.5	4.20	21.5	17 38.4	19 0.9	+ 3 52.8	-0.2707	0.5684	0.1826	+26	-47
20 H ¹ . Arietis	6.4	+4.19	+21.6	16 50.5	19 42.2	+ 4 32.6	+0.6648	0.5685	+0.1813	+89	+ 3
26 Arietis	6.2	4.18	19.7	19 29.6	5 4 40.9	-10 48.3	-0.4822	0.5697	0.1637	+14	-58
μ Arietis	5.7	4.15	18.9	19 39.8	9 37.8	- 6 2.3	+0.1271	0.5703	0.1534	+48	-22
47 Arietis	5.8	4.13	17.7	20 20.5	16 13.8	+ 0 19.2	+0.3988	0.5709	0.1391	+66	- 7
e Arietis (mean)	4.6	4.13	17.4	21 0.8	16 42.3	+ 0 46.6	-0.2270	0.5710	0.1381	+28	-40
5 Arietis	5.0	+4.08	+16.3	20 44.5	23 17.7	+ 7 7.4	+0.9165	0.5714	+0.1233	+90	+25
r Arietis	5.2	4.06	15.9	20 51.2	6 1 56.7	+ 9 40.5	+1.1224	0.5716	0.1173	+90	+41
66 Arietis	6.1	4.08	14.8	22 31.4	4 57.0	-11 25.8	-0.2656	0.5716	0.1108	+26	-39
16 Tauri	5.4	4.06	13.0	24 2.0	11 47.2	- 4 50.8	-1.1406	0.5716	0.0941	-33	-66
17 Tauri	3.8	4.05	13.1	23 51.4	11 49.1	- 4 49.0	-0.9541	0.5716	0.0941	-17	-66
20 Tauri	4.1	+4.06	+12.9	24 6.8	12 12.8	- 4 26.2	-1.1843	0.5716	+0.0931	-38	-66
23 Tauri	4.3	4.04	13.0	23 41.7	12 25.7	- 4 13.8	-0.7279	0.5715	0.0926	- 1	-66
7 Tauri	3.0	4.04	12.9	23 51.2	12 54.7	- 3 45.8	-0.8492	0.5715	0.0915	- 9	-66
104 B. Tauri	5.5	4.02	13.1	23 10.2	13 16.9	- 3 24.4	-0.1039	0.5715	0.0906	+35	-28
27 Tauri	3.7	4.04	12.8	23 48.2	13 36.9	- 3 5.2	-0.7349	0.5715	0.0898	- 2	-66
28 Tauri	5.2	+4.04	+12.8	23 53.3	13 37.5	- 3 4.6	-0.8212	0.5715	+0.0898	- 7	-66
133 B. Tauri	5.9	3.99	13.3	21 59.8	13 57.4	- 2 45.4	+1.1828	0.5715	0.0890	+90	+49
32 Tauri	5.8	3.97	12.7	22 14.6	16 51.9	+ 0 2.7	+1.1754	0.5714	0.0820	+90	+49
33 Tauri	6.0	3.99	12.5	22 56.3	16 56.5	+ 0 7.1	+0.4540	0.5713	0.0818	+71	+ 2
161 B. Tauri	6.5	3.97	12.1	22 58.3	18 34.2	+ 1 41.2	+0.5508	0.5712	0.0778	+79	+ 8
36 Tauri	5.6	+3.98	+11.6	23 52.9	19 59.4	+ 3 3.2	-0.2947	0.5711	+0.0744	+24	-38
62 Tauri	6.1	3.91	9.9	24 6.7	4 14.4	+11 0.0	-0.0061	0.5701	0.0543	+40	-20
284 B. Tauri	6.0	3.84	9.1	23 10.5	9 31.2	- 7 54.8	+1.2372	0.5692	0.0413	+82	+60
95 Tauri	6.2	3.83	8.4	23 56.1	12 21.8	- 5 10.5	+0.5419	0.5687	0.0344	+79	+11
300 B. Tauri	6.2	3.80	8.3	23 28.7	13 25.2	- 4 9.4	+1.0604	0.5684	0.0318	+90	+44
315 B. Tauri	6.3	+3.79	+ 7.1	24 27.8	17 53.2	+ 0 8.8	+0.1360	0.5673	+0.0209	+49	- 9
99 Tauri	6.0	3.76	7.2	23 49.3	18 33.3	+ 0 47.5	+0.8308	0.5672	0.0193	+90	-29
k Tauri	5.6	3.79	6.7	24 55.5	18 41.1	+ 0 55.1	-0.3399	0.5672	0.0190	+21	-35
103 Tauri	5.5	3.72	6.2	24 9.5	22 56.7	+ 5 1.4	+0.5359	0.5660	+0.0087	+78	+13
118 Tauri	5.4	3.65	4.1	25 5.1	8 1.6	-10 13.4	-0.4751	0.5630	-0.0130	+13	-44
121 Tauri	5.1	+3.59	+ 4.0	23 59.2	10 43.2	- 7 37.5	+0.6600	0.5620	-0.0194	+90	+19
132 Tauri	5.0	3.54	2.6	24 32.5	16 37.2	- 1 56.1	-0.0903	0.5597	0.0330	+35	-22
412 B. Tauri	5.8	3.49	2.1	24 14.4	20 6.1	+ 1 25.4	+0.1068	0.5582	0.0409	+47	-13
1 Geminorum	4.3	3.43	1.8	23 16.2	23 17.3	+ 4 29.9	+1.0128	0.5569	0.0481	+90	+39
3 Geminorum	5.6	3.40	1.4	23 7.7	9 1 46.7	+ 6 54.1	+1.0395	0.5557	0.0536	+90	+40
5 Geminorum	5.9	+3.42	+ 0.8	24 26.4	2 33.5	+ 7 39.3	-0.4214	0.5553	-0.0553	+17	-44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallaxes.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	'	d h m	h m				"	"
6 Geminorum	6.3	+3.38	+1.3	+22 55.7	9 2 55.9	+8 1.0	+1.1932	0.5552	-0.0562	+90	+53
8 Geminorum	6.1	3.39	0.6	23 53.9	4 41.8	+9 43.2	-0.0666	0.5543	0.0600	+37	-24
9 Geminorum	6.2	3.38	0.6	23 46.2	4 59.7	+10 0.4	+0.1621	0.5542	0.0606	+50	-12
36 B. Geminorum	6.0	3.33	+0.1	23 22.5	8 50.7	-10 16.5	+0.3424	0.5523	0.0689	+62	-3
d Geminorum	5.2	3.16	-1.5	21 51.6	20 42.3	+1 11.0	+1.0311	0.5462	0.0932	+90	+35
87 B. Geminorum	5.8	+3.20	-2.2	+23 42.0	20 52.9	+1 21.2	-0.9931	0.5461	-0.0936	-19	-66
44 Geminorum	5.9	3.11	2.8	22 45.7	10 3 3.9	+7 19.8	-0.5857	0.5428	0.1054	+8	-59
120 B. Geminorum	6.5	3.05	3.1	21 23.5	5 20.7	+9 32.2	+0.6679	0.5416	0.1097	+90	+10
8 Geminorum	3.5	3.02	3.8	22 8.1	10 2.4	+9 55.4	-0.6817	0.5390	0.1183	+2	-67
56 Geminorum	5.2	2.98	3.4	20 36.0	10 55.9	-9 3.6	+0.8949	0.5386	0.1199	+90	+23
149 B. Geminorum	6.4	+2.96	-4.1	+21 42.1	13 15.1	-6 48.9	-0.5956	0.5373	-0.1239	+7	-62
61 Geminorum	5.8	2.95	3.7	20 25.4	13 18.3	-6 45.8	+0.8004	0.5373	0.1241	+90	+17
63 Geminorum	5.3	2.97	4.2	21 36.9	13 40.2	-6 24.7	-0.5529	0.5371	0.1247	+10	-59
79 Geminorum	6.3	2.86	5.1	20 30.9	22 4.2	+1 43.3	-0.4520	0.5325	0.1387	+16	-54
209 B. Geminorum	6.2	2.81	5.2	19 32.2	11 1 23.9	+4 56.6	+0.1537	0.5307	0.1440	+49	-21
85 Geminorum	5.2	+2.80	-5.7	+20 6.1	3 12.6	+6 41.9	-0.7328	0.5298	-0.1468	-1	-70
217 B. Geminorum	6.3	2.78	6.0	20 2.6	5 44.3	+9 8.9	-1.0440	0.5284	0.1507	-22	-70
10 H. Cancri	6.1	2.74	6.0	19 4.5	7 42.7	+11 3.7	-0.2776	0.5274	0.1536	-25	-45
ζ Cancri (mean)	4.7	2.68	6.2	17 53.8	11 26.2	-9 19.7	+0.4412	0.5254	0.1589	+69	-8
d ¹ Cancri	5.9	2.64	7.0	18 35.9	17 2.0	-3 54.1	-1.2448	0.5226	0.1666	-41	-71
d ² Cancri	6.2	+2.60	-7.0	+17 19.1	18 18.5	-2 40.0	-0.0440	0.5220	-0.1683	+38	-34
90 B. Cancri	6.3	2.54	7.1	15 36.0	23 33.9	+2 26.0	+0.9564	0.5194	0.1750	+90	+20
54 Cancri	6.3	2.47	7.9	15 39.4	12 7 14.8	+9 53.3	-0.4871	0.5160	0.1841	+14	-62
o ¹ Cancri	5.1	2.45	8.3	15 38.4	10 28.8	-10 58.5	-1.0687	0.5146	0.1876	-22	-74
222 B. Cancri	6.3	2.32	8.6	11 50.8	21 23.3	-0 22.9	+1.0830	0.5102	0.1985	+90	+22
ξ Leonis	5.1	+2.26	-9.4	+11 39.9	13 4 55.2	+6 56.1	-0.2848	0.5076	-0.2050	+25	-53
o Leonis	3.8	2.22	9.6	10 16.1	9 53.9	+11 46.3	+0.2382	0.5060	0.2088	+54	-25
83 B. Leonis	5.9	2.17	10.1	9 19.5	18 12.4	-4 9.1	-0.4719	0.5037	0.2145	+16	-66
89 B. Leonis	6.2	2.16	10.1	8 42.5	19 8.0	-3 15.1	+0.0145	0.5036	0.2151	+41	-38
π Leonis	4.9	2.15	10.2	+8 26.4	20 16.7	-2 8.3	+0.0656	0.5033	0.2158	+44	-35
NEW MOON.											
75 Virginis	5.6	+2.20	-14.6	-14 56.4	18 15 39.4	-9 59.2	+0.6128	0.5222	-0.1911	+71	-7
83 Virginis	5.6	2.25	14.6	15 46.0	21 30.2	-4 19.1	+0.4162	0.5254	0.1845	+57	-18
85 Virginis	6.1	2.25	14.5	15 21.3	22 3.1	-3 47.2	-0.1841	0.5257	0.1839	+27	-48
214 G. Virginis	6.5	+2.34	-14.2	-15 56.6	19 7 45.2	+5 37.1	-1.2165	0.5312	-0.1716	-42	-90
43 H. Virginis	5.5	2.41	14.4	17 49.1	12 41.0	+10 23.5	-0.0052	0.5341	0.1647	+31	-41
231 G. Virginis	6.4	2.42	14.4	18 12.2	13 28.8	+11 9.8	+0.2835	0.5346	0.1636	+47	-25
236 G. Virginis	5.7	2.42	14.5	18 20.1	14 14.4	+11 53.9	+0.3027	0.5350	0.1624	+48	-24
9 G. Libræ	6.5	2.53	14.4	20 4.8	21 57.1	-4 38.2	+0.9840	0.5397	0.1507	+70	+17
17 G. Libræ	6.4	+2.60	-14.3	-20 49.7	20 3 16.3	+0 30.5	+1.0137	0.5430	-0.1420	+69	+20
18 G. Libræ	6.1	2.60	14.3	20 58.9	3 45.4	+0 58.7	+1.1099	0.5433	0.1411	+69	+28
43 B. Libræ	5.7	2.72	15.2	21 2.8	8 27.4	+5 31.3	+0.5344	0.5462	0.1330	+59	-11
47 G. Libræ	6.1	2.73	13.8	21 42.8	12 37.1	+9 32.7	+0.7141	0.5488	0.1255	+68	0
64 G. Libræ	5.8	2.79	13.4	22 5.8	17 7.9	-10 5.7	+0.5779	0.5515	0.1170	+60	-8
169 B. Libræ	6.0	+2.94	-12.6	-22 52.2	21 2 42.2	-0 51.2	+0.3761	0.5572	-0.0980	+45	-19
177 B. Libræ	6.2	2.95	12.5	22 53.0	3 23.5	-0 11.2	+0.3225	0.5576	0.0965	+41	-22
42 Libræ	5.0	2.96	12.6	23 33.2	3 47.4	+0 11.9	+1.0005	0.5578	0.0957	+66	+20
31 B. Scorpii	5.4	3.06	12.1	24 17.4	9 45.4	+5 57.3	+1.2520	0.5612	0.0830	+66	+49
32 B. Scorpii	5.3	3.05	11.9	23 44.1	9 46.8	+5 58.6	+0.6577	0.5612	0.0829	+63	-3
δ Scorpii	2.5	+3.07	-11.1	-22 23.4	12 35.1	+8 40.9	-1.0003	0.5627	-0.0768	-35	+90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y'</i>	<i>z'</i>	<i>y'</i>	N. S.
		$\Delta\alpha$	$\Delta\delta$							
		s	"	'	d h m	h m				' "
50 B. Scorpii	6.4	+3.13	-11.6	-24 30.1	21 14 6.3	+10 8.8	+1.1347	0.5635	-0.0734	+66+33
57 B. Scorpii	5.7	3.13	11.1	23 23.0	15 4.2	+11 4.7	-0.1251	0.5640	0.0713	+14-48
24 G. Scorpii	6.2	3.16	11.3	24 14.6	15 49.0	+11 47.9	+0.7376	0.5644	0.0696	+66+ 2
27 G. Scorpii	5.8	3.15	11.0	23 28.1	16 12.1	-11 49.8	-0.1150	0.5646	0.0687	+15-47
41 G. Scorpii	6.3	3.19	10.9	24 12.8	18 21.1	- 9 45.5	+0.5354	0.5657	0.0639	+52-10
19 Scorpii	4.9	+3.23	-10.4	-23 58.4	21 18.0	- 6 55.0	+0.1011	0.5672	-0.0570	+25-35
ρ Ophiuchi	4.7	3.25	9.8	23 15.5	23 25.2	- 4 52.5	-0.7712	0.5682	0.0521	-22-90
22 Scorpii	4.8	3.32	10.0	24 56.2	23 1 21.5	- 3 0.4	+0.9085	0.5691	0.0475	+65+14
126 B. Scorpii	6.1	3.38	9.0	24 18.6	6 11.1	+ 1 38.6	+0.0441	0.5712	0.0360	+20-38
88 B. Ophiuchi	6.3	3.51	7.8	24 58.2	13 51.4	+ 9 1.9	+0.5331	0.5742	0.0172	+48-10
26 Ophiuchi	5.8	+3.51	- 7.8	-24 51.9	13 56.3	+ 9 6.6	+0.4225	0.5742	-0.0170	+41-16
137 B. Ophiuchi	6.3	3.60	6.9	25 9.3	18 57.0	-10 4.0	+0.6719	0.5759	-0.0045	+59- 2
39 Ophiuchi	5.1	3.61	6.1	24 12.0	21 21.4	- 7 45.0	-0.3342	0.5767	+0.0016	- 3-62
θ Ophiuchi	3.4	3.65	6.0	24 55.2	22 59.5	- 6 10.6	+0.4260	0.5771	0.0058	+40-16
191 B. Ophiuchi	6.3	3.65	5.4	24 10.2	23 0 16.7	- 4 56.4	-0.3485	0.5774	0.0090	- 3-63
δ Ophiuchi	4.3	+3.66	- 5.4	-24 6.1	0 48.1	- 4 26.2	-0.4149	0.5776	+0.0104	- 7-68
51 Ophiuchi	4.8	3.68	4.9	23 54.0	2 52.8	- 2 26.1	-0.5973	0.5781	0.0157	-16-85
63 Ophiuchi	6.1	3.86	3.1	24 52.4	12 29.0	+ 6 48.2	+0.6830	0.5800	0.0402	+62- 1
4 Sagittarii	4.8	3.85	2.3	23 48.6	14 29.8	+ 8 44.4	-0.3339	0.5803	0.0454	+ 1-62
7 Sagittarii	5.5	3.89	2.2	24 17.0	15 44.2	+ 9 56.0	+0.2150	0.5804	0.0486	+31-28
9 Sagittarii	6.0	+3.89	- 2.0	-24 21.8	16 9.2	+10 20.1	+0.3192	0.5805	+0.0497	+37-22
1 Sagittarii	5.2	3.92	- 1.1	23 43.2	19 21.7	-10 34.8	-0.1760	0.5808	0.0578	+10-51
24 Sagittarii	5.7	4.06	+ 0.8	24 5.7	4 22.8	- 1 54.3	+0.8352	0.5811	0.0807	+66+ 8
117 B. Sagittarii	5.8	4.07	1.5	23 34.6	6 16.2	- 0 5.3	+0.4576	0.5811	0.0854	+49-15
26 Sagittarii	6.1	4.10	1.7	23 54.7	7 37.6	+ 1 13.0	+0.9196	0.5811	0.0888	+66+14
28 Sagittarii	5.6	+4.08	+ 2.6	-22 28.8	9 28.4	+ 2 59.6	-0.3829	0.5810	+0.0934	+ 3-65
30 Sagittarii	6.2	4.09	3.1	22 15.4	11 18.6	+ 4 45.6	-0.4346	0.5809	0.0980	+ 1-69
33 Sagittarii	5.8	4.08	3.7	21 27.7	12 36.5	+ 6 0.5	-1.1204	0.5808	0.1011	-42-90
γ^1 Sagittarii	5.0	4.13	3.2	22 50.8	12 39.4	+ 6 3.4	+0.3044	0.5809	0.1012	+41-23
γ^2 Sagittarii	5.1	4.14	3.4	22 46.5	13 2.5	+ 6 25.4	+0.2694	0.5808	0.1022	+39-25
154 B. Sagittarii	5.9	+4.15	+ 3.3	-23 16.8	13 24.1	+ 6 46.2	+0.8231	0.5808	+0.1030	+67+ 7
ξ Sagittarii	3.7	4.10	4.2	21 12.9	14 7.9	+ 7 28.4	-1.2142	0.5808	0.1048	-52-89
168 B. Sagittarii	6.3	4.17	4.0	22 48.7	15 42.0	+ 8 58.9	+0.5869	0.5806	0.1086	+59- 7
σ Sagittarii	3.9	4.16	4.6	21 51.8	16 57.4	+10 11.4	-0.2452	0.5805	0.1117	+12-55
π Sagittarii	3.0	4.15	5.4	21 9.3	19 2.7	-11 48.1	-0.7291	0.5803	0.1167	-14-90
199 B. Sagittarii	6.4	+4.19	+ 5.4	-21 47.7	20 8.3	-10 45.0	+0.0538	0.5802	+0.1193	+28-37
222 B. Sagittarii	5.5	4.25	6.0	22 33.4	23 28.3	- 7 32.5	+1.2384	0.5797	0.1271	+67+44
50 Sagittarii	5.5	4.26	6.8	21 56.4	1 48.4	- 5 17.8	+0.9130	0.5794	0.1324	+68+13
253 B. Sagittarii	6.1	4.27	7.4	21 29.0	3 41.7	- 3 28.8	+0.7026	0.5791	0.1368	+68- 1
<i>f</i> Sagittarii	5.1	4.28	9.4	19 57.5	10 4.9	+ 2 39.9	+0.0743	0.5779	0.1510	+32-36
57 Sagittarii	6.0	+4.29	+10.2	-19 15.2	12 29.7	+ 4 59.3	-0.2681	0.5774	+0.1562	+15-56
31 B. Capricorni	6.4	4.35	14.7	16 0.8	3 43.2	- 4 21.4	-0.9124	0.5739	0.1865	-18-90
ρ Capricorni	5.0	4.40	14.1	18 5.1	3 45.2	- 4 19.5	+1.1719	0.5739	0.1865	+72+32
47 B. Capricorni	6.2	4.39	15.1	16 48.5	6 33.7	- 1 37.2	+0.4221	0.5732	0.1916	+57-18
τ Capricorni	5.2	4.36	15.9	15 14.5	8 9.1	- 0 5.4	-0.8381	0.5729	0.1945	-12-90
61 B. Capricorni	5.9	+4.39	+15.8	-16 24.9	8 40.5	+ 0 24.8	+0.4383	0.5727	+0.1954	+58-17
95 B. Capricorni	5.9	4.42	17.8	14 48.0	16 21.2	+ 7 48.7	+0.3724	0.5708	0.2081	+56-20
53 B. Aquarii	6.5	4.44	19.5	13 32.5	23 42.7	- 9 6.0	+0.6910	0.5691	0.2190	+76- 3
18 Aquarii	5.5	4.46	20.3	13 13.8	3 12.7	- 5 43.7	+1.1545	0.5683	0.2237	+77+28
72 B. Aquarii	6.5	4.43	21.0	11 55.4	4 57.2	- 4 3.0	+0.2492	0.5680	0.2260	+50-27
137 B. Capricorni	6.2	+4.44	+22.0	-10 56.7	9 47.0	+ 0 36.3	+0.3853	0.5670	+0.2318	+59-20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"		d h m	h m					
c ¹ Capricorni	5.3	+4.43	+22.8	9 27.5	27 12 10.6	+2 54.7	-0.5281	0.5665	+0.2345	+10	-74
c ² Capricorni	6.3	4.43	22.8	9 39.2	12 43.2	+3 26.2	-0.2071	0.5664	0.2351	+27	-52
30 Aquarii	5.6	4.43	24.5	6 55.0	20 4.7	+10 31.8	-1.1520	0.5652	0.2423	-29	-90
44 Aquarii	5.7	4.44	25.6	5 47.7	23 2 4.9	+7 40.9	-0.7876	0.5644	0.2471	-3	-90
51 Aquarii	5.8	4.45	26.0	5 15.0	5 7.6	+4 44.7	-0.5685	0.5641	0.2491	+10	-77
κ Aquarii	5.2	+4.46	+26.8	-4 38.9	11 4.0	+0 59.1	+0.3304	0.5636	+0.2524	+59	-23
207 B. Aquarii	6.3	4.47	27.1	3 58.7	12 23.6	+2 15.8	+0.0060	0.5635	0.2530	+40	-40
6 G. Piscium	6.2	4.49	27.9	2 49.9	20 0.5	+9 36.5	+0.8163	0.5632	0.2555	+87	+4
22 B. Piscium	6.4	4.51	29.1	0 9.4	29 7 2.0	+3 45.4	+1.0117	0.5634	0.2563	+90	+16
κ Piscium	4.9	4.51	29.2	+0 48.6	8 31.0	+2 19.7	+0.4433	0.5635	0.2561	+67	-17
9 Piscium	6.4	+4.51	+29.2	+0 40.5	8 39.3	+2 11.7	+0.6109	0.5636	+0.2561	+80	-8
16 Piscium	5.7	4.51	29.5	1 39.0	12 38.6	+1 39.2	+0.6732	0.5638	0.2554	+87	-5
19 Piscium	5.4	4.52	29.7	3 2.1	16 59.4	+5 50.8	+0.4203	0.5643	0.2540	+65	-18
36 Piscium	6.2	4.56	29.9	7 47.3	30 6 3.4	+5 33.4	-0.9791	0.5662	0.2468	-14	-82
d Piscium	5.4	4.57	29.8	7 44.3	7 47.6	+3 52.9	-0.5025	0.5665	0.2455	+14	-69
136 B. Piscium	6.5	+4.60	+29.4	+8 54.6	16 38.5	+4 38.8	+0.4795	0.5683	+0.2375	+70	-13

OCTOBER.

75 Piscium	6.3	+4.66	+28.7	+12 31.2	1 3 25.8	-8 57.3	-0.5943	0.5708	+0.2248	+8	-72
η Piscium	3.7	+4.71	+27.4	+14 55.6	13 56.1	+1 9.9	-0.7028	0.5735	+0.2097	+2	-75
101 Piscium	6.2	4.70	27.3	14 14.7	15 44.4	+2 54.2	+0.3511	0.5739	0.2068	+61	-16
105 Piscium	6.1	4.73	26.9	15 59.6	17 21.8	+4 27.9	-1.0577	0.5743	0.2042	-21	-74
4 Arietis	5.8	4.74	26.3	16 33.0	20 54.8	+7 53.0	-0.9016	0.5752	0.1982	-10	-73
ϵ Arietis	5.1	4.76	25.7	17 25.2	2 0 43.6	+11 33.3	-1.0304	0.5761	0.1914	-20	-73
35 B. Arietis	6.4	+4.76	+25.2	+17 51.7	3 21.9	-9 54.2	-0.9757	0.5767	+0.1865	-16	-72
47 B. Arietis	6.5	4.76	25.0	17 38.5	5 2.9	-8 17.1	-0.4442	0.5771	0.1833	+16	-57
20 H ¹ Arietis	6.4	4.75	24.9	16 50.5	5 43.2	-7 38.3	+0.4802	0.5772	0.1820	+71	-7
26 Arietis	6.2	4.80	23.1	19 29.6	14 28.2	+0 47.0	-0.6711	0.5790	0.1644	+3	-69
μ Arietis	5.7	4.79	22.2	19 39.9	19 17.2	+5 25.1	-0.0774	0.5798	0.1542	+36	-33
47 Arietis	5.8	+4.81	+20.8	+20 20.6	3 1 42.4	+11 35.8	+0.1800	0.5807	+0.1398	+51	-18
ϵ Arietis (mean)	4.6	4.81	20.6	21 0.9	2 10.1	-11 57.5	-0.4385	0.5807	0.1388	+16	-52
ζ Arietis	5.0	4.78	19.3	20 44.6	8 34.5	-5 47.8	+0.6806	0.5813	0.1239	+90	+10
τ Arietis	5.2	4.78	18.7	20 51.2	11 9.0	-3 19.2	+0.8800	0.5814	0.1178	+90	+23
66 Arietis	6.1	4.82	17.6	22 31.4	14 4.3	-0 30.6	-0.4939	0.5814	0.1108	+13	-53
17 Tauri	3.8	+4.83	+15.8	+23 51.5	20 44.6	+5 54.5	-1.1818	0.5814	+0.0944	-38	-66
23 Tauri	4.3	4.82	15.6	23 41.7	21 20.2	+6 28.7	-0.9594	0.5813	0.0930	-17	-66
η Tauri	3.0	4.82	15.5	23 51.2	21 48.4	+6 55.9	-1.0796	0.5813	0.0918	-27	-66
104 B. Tauri	5.5	4.80	15.6	23 10.3	22 10.0	+7 16.6	-0.3447	0.5813	0.0909	+21	-42
27 Tauri	3.7	4.82	15.3	23 48.3	22 29.4	+7 35.3	-0.9676	0.5813	0.0901	-18	-66
28 Tauri	5.2	+4.82	+15.3	+23 53.3	22 30.0	+7 35.9	-1.0528	0.5813	+0.0901	-25	-66
133 B. Tauri	5.9	4.76	15.8	21 59.8	22 49.3	+7 54.4	+0.9241	0.5813	0.0893	+90	+29
32 Tauri	5.8	4.76	15.0	22 14.6	4 1 38.9	+10 37.6	+0.9134	0.5810	0.0822	+90	+29
33 Tauri	6.0	4.78	14.8	22 56.4	1 43.4	+10 41.8	+0.2015	0.5810	0.0820	+52	-11
161 B. Tauri	6.5	4.77	14.4	22 58.3	3 18.4	-11 46.8	+0.2953	0.5808	0.0780	+59	-6
36 Tauri	5.6	+4.79	+13.8	+23 52.9	4 41.1	-10 27.2	-0.5405	0.5807	+0.0746	+10	-53
62 Tauri	6.1	4.74	11.8	24 6.7	12 42.5	-2 44.1	-0.2638	0.5794	0.0543	+25	-34
72 Tauri	5.4	4.69	11.9	22 48.8	14 4.7	-1 25.0	+1.1591	0.5790	0.0508	+90	+51
284 B. Tauri	6.0	4.68	10.8	23 10.5	17 50.7	+2 12.4	+0.9585	0.5782	0.0412	+90	+35
95 Tauri	6.2	4.68	9.9	23 56.1	20 36.9	+4 52.4	+0.2701	0.5774	0.0342	+57	-3
300 B. Tauri	6.2	+4.65	+9.8	+23 28.8	21 38.7	+5 51.9	+0.7810	0.5771	+0.0316	+90	+25

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallaxes.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
315 B. Tauri	6.3	+4.65	+8.3	+24 27.8	d 1 59.8	+10 3.2	-0.1345	0.5758	+0.0206	+32	-24
99 Tauri	6.0	4.62	8.4	23 49.3	2 38.9	+10 40.9	+0.5508	0.5756	0.0190	+79	+13
k Tauri	5.6	4.66	8.0	24 55.5	2 46.4	+10 48.1	-0.6049	0.5755	0.0187	+6	-54
103 Tauri	5.5	4.59	7.2	24 9.5	6 55.7	-9 11.9	+0.2570	0.5740	+0.0083	+56	-2
118 Tauri	5.4	4.54	4.6	25 5.1	15 47.8	-0 39.4	-0.7465	0.5703	-0.0135	-3	-65
121 Tauri	5.1	+4.48	+4.4	+23 59.2	18 25.7	+1 52.6	+0.3738	0.5691	-0.0198	+64	+3
394 B. Tauri	6.0	4.41	3.8	23 10.0	21 47.5	+5 7.1	+1.1655	0.5674	0.0279	+90	+53
132 Tauri	5.0	4.43	2.8	24 32.5	6 0 12.2	+7 26.5	-0.3701	0.5663	0.0335	+19	-39
412 B. Tauri	5.8	4.38	2.0	24 14.4	3 36.8	+10 43.7	-0.1763	0.5645	0.0415	+30	-28
1 Geminorum	4.3	4.31	1.6	23 16.2	6 44.2	-10 15.5	+0.7190	0.5628	0.0486	+90	+19
3 Geminorum	5.6	+4.28	+1.1	+23 7.7	9 10.8	-7 54.2	+0.7451	0.5614	-0.0541	+90	+21
5 Geminorum	5.9	4.32	0.4	24 26.4	9 56.7	-7 9.9	-0.7005	0.5610	0.0558	0	-84
6 Geminorum	6.3	4.26	0.9	22 55.7	10 18.7	-6 48.7	+0.8970	0.5608	0.0566	+90	+30
7 Gemin. (var.)	3.2	4.23	0.8	22 31.9	11 26.4	-5 43.3	+1.2570	0.5601	0.0591	+79	+62
8 Geminorum	6.1	4.27	0.1	23 59.9	12 2.7	-5 8.3	-0.3498	0.5597	0.0604	+20	-40
9 Geminorum	6.2	+4.26	+0.1	+23 46.2	12 20.3	-4 51.4	-0.1236	0.5595	-0.0611	+33	-27
μ Geminorum	3.2	4.19	-0.1	22 33.4	14 59.2	-2 18.0	+1.0088	0.5580	0.0669	+90	+37
36 B. Geminorum	6.0	4.20	0.6	23 22.4	16 7.2	-1 12.5	+0.0546	0.5574	0.0693	+43	-18
d Geminorum	5.2	4.01	2.7	21 51.6	7 3 47.8	+10 4.0	+0.7376	0.5501	0.0935	+90	+16
87 B. Geminorum	5.8	4.07	3.4	23 42.0	3 58.3	+10 14.2	-1.2687	0.5500	0.0938	-53	-66
44 Geminorum	5.9	+3.96	+4.3	+22 45.7	10 4.3	-7 52.2	-0.8642	0.5462	-0.1055	-10	-67
120 B. Geminorum	6.5	3.89	4.6	21 23.5	12 19.4	-5 41.7	-0.3798	0.5447	0.1098	+64	-5
6 Geminorum	3.5	3.86	5.5	22 8.1	16 58.0	-1 12.2	-0.9580	0.5418	0.1182	-16	-68
56 Geminorum	5.2	3.80	5.1	20 36.0	17 50.9	-0 21.1	+0.6072	0.5412	0.1198	+84	+6
149 B. Geminorum	6.4	3.79	6.0	21 42.1	20 8.6	+1 52.2	-0.8714	0.5398	0.1238	-10	-69
61 Geminorum	5.8	+3.77	+5.5	+20 25.4	20 11.9	+1 55.3	+0.5145	0.5397	-0.1239	+75	0
63 Geminorum	5.3	3.79	6.1	21 36.9	20 33.6	+2 16.3	-0.8289	0.5395	0.1245	-7	-68
79 Geminorum	6.3	3.66	7.2	20 30.9	4 53.0	+10 19.7	-0.7250	0.5343	0.1383	0	-69
g Geminorum	5.0	3.61	6.6	18 42.7	5 23.0	+10 48.7	+1.1771	0.5339	0.1391	+90	+43
209 B. Geminorum	6.2	3.59	7.4	19 32.2	8 11.2	-10 28.5	-0.1211	0.5322	0.1435	+33	-36
85 Geminorum	5.2	+3.58	+7.9	+20 6.1	9 59.2	-8 43.9	-1.0012	0.5311	-0.1462	-19	-70
217 B. Geminorum	6.3	3.55	8.3	20 2.5	12 29.8	-6 17.9	-1.3090	0.5296	0.1500	-55	-69
10 H. Cancri	6.1	3.50	8.3	19 4.5	14 27.5	-4 23.9	-0.5455	0.5284	0.1528	+10	-62
ζ Cancri (mean)	4.7	3.44	8.6	17 53.8	18 9.6	-0 48.7	+0.1724	0.5263	0.1581	+50	-22
d ² Cancri	6.2	3.33	9.5	17 19.1	9 1 0.0	+5 49.1	-0.3041	0.5225	0.1672	+24	-49
90 B. Cancri	6.3	+3.24	+9.6	+15 35.9	6 14.2	+10 53.9	+0.6975	0.5196	-0.1737	+90	+4
54 Cancri	6.3	3.15	10.6	15 39.4	13 53.9	-5 40.2	-0.7314	0.5158	0.1825	0	-74
o ¹ Cancri	5.1	3.12	11.0	15 38.3	17 7.4	-2 32.4	-1.3069	0.5143	0.1860	-48	-74
222 B. Cancri	6.3	2.95	11.2	11 50.8	10 4 1.1	+8 2.5	+0.8034	0.5096	0.1966	+90	+7
ξ Leonis	5.1	2.86	12.1	11 39.9	11 32.6	-8 38.9	-0.4988	0.5069	0.2029	+14	-66
h Leonis	5.2	+2.84	+11.6	+10 4.8	11 33.8	-8 37.8	+1.2546	0.5069	-0.2029	+90	+41
o Leonis	3.8	2.79	12.2	10 16.0	16 31.2	-3 48.8	+0.0315	0.5054	0.2067	+42	-36
83 B. Leonis	5.9	2.71	12.7	9 19.4	10 0 49.5	+4 15.5	-0.6622	0.5031	0.2122	+5	-79
89 B. Leonis	6.2	2.70	12.6	8 42.4	1 45.1	+5 9.6	-0.1749	0.5029	0.2128	+31	-48
π Leonis	4.9	2.68	12.6	8 26.4	2 53.8	+6 16.3	-0.1217	0.5027	0.2135	+34	-45
43 Leonis	6.3	+2.57	+13.4	+6 57.6	15 26.1	-5 32.1	-1.1991	0.5005	-0.2198	-31	-83
155 B. Leonis	6.5	2.55	13.1	6 6.7	15 35.0	-5 23.4	-0.2893	0.5005	0.2199	+25	-56
237 B. Leonis	6.3	2.41	13.2	1 27.7	13 7 39.1	+10 14.4	+1.2931	0.4995	0.2249	+90	+41
55 Leonis	6.1	2.40	13.3	1 10.6	9 34.6	-11 53.3	+1.1761	0.4995	0.2253	+90	+29
p ³ Leonis	6.1	2.36	13.4	0 26.6	13 58.3	-7 36.8	+0.9969	0.4997	0.2260	+90	+15
p ⁵ Leonis	5.3	+2.34	+13.7	+0 22.7	19 35.8	-2 8.6	-0.2052	0.5001	-0.2265	+29	-52

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	γ'	α'	δ'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
388 B. Leonis	6.3	+2.29	-13.7	-1 14.8	18 3 25.2	+ 5 28.0	-0.1774	0.5011	-0.2265	+31	-50
e Leonis	5.1	2.28	13.6	2 32.9	4 45.3	+ 6 45.9	+0.9614	0.5013	0.2264	+87	+13
431 B. Leonis	6.2	2.27	13.8	1 58.8	9 12.5	+11 5.7	-0.6749	0.5021	0.2259	+ 4	-87
NEW MOON.											
47 G. Libræ	6.1	+2.53	-12.0	-21 42.8	17 18 8.8	- 7 8.2	+0.8902	0.5529	-0.1245	+68	+12
64 G. Libræ	5.8	2.57	11.7	22 5.8	22 37.4	- 2 48.8	+0.7620	0.5555	0.1160	+68	+ 3
169 B. Libræ	6.0	2.67	10.9	22 52.2	18 8 7.7	+ 6 21.6	+0.5760	0.5608	0.0968	+58	- 8
177 B. Libræ	6.2	2.68	10.8	22 53.0	8 48.7	+ 7 1.2	+0.5235	0.5612	0.0954	+54	-11
42 Libræ	5.0	2.69	10.9	23 33.1	9 12.5	+ 7 24.2	+1.2015	0.5613	0.0946	+66	+40
32 B. Scorpii	5.3	+2.75	-10.3	-23 44.1	15 10.0	-10 50.9	+0.8680	0.5643	-0.0818	+66	+10
δ Scorpii	2.5	2.76	9.6	22 23.3	17 57.6	- 8 9.3	-0.7859	0.5656	0.0756	-21	-90
57 B. Scorpii	5.7	2.81	9.5	23 23.0	20 26.2	- 5 46.0	+0.0926	0.5668	0.0701	+26	-35
24 G. Scorpii	6.2	2.83	9.6	24 14.6	21 10.9	- 5 2.9	+0.9565	0.5671	0.0685	+66	+18
27 G. Scorpii	5.8	2.82	9.4	23 28.0	21 33.9	- 4 40.8	+0.1043	0.5673	0.0675	+26	-34
41 G. Scorpii	6.3	+2.86	- 9.3	-24 12.8	23 42.6	- 2 36.7	+0.7577	0.5682	-0.0626	+66	+ 4
19 Scorpii	4.9	2.89	8.8	23 58.4	2 39.2	+ 0 13.5	+0.3269	0.5694	0.0559	+38	-22
ρ Ophiuchi	4.7	2.90	8.4	23 15.5	4 46.2	+ 2 15.9	-0.5438	0.5702	0.0509	-10	-78
22 Scorpii	4.8	2.95	8.5	24 56.1	6 42.5	+ 4 8.0	+1.1404	0.5710	0.0464	+65	+35
VENUS	-3.7	...	...	24 3.0	7 57.1	+ 5 19.9	+0.1454	0.5227	0.0335	+26	-32
126 B. Scorpii	6.1	+2.99	- 7.6	-24 18.6	11 32.3	+ 8 47.2	+0.2802	0.5726	-0.0348	+33	-24
24 Ophiuchi	5.5	3.05	6.3	23 1.3	17 56.3	- 9 3.0	-1.2538	0.5745	0.0193	-64	-78
88 B. Ophiuchi	6.3	3.10	6.6	24 58.1	19 13.8	- 7 48.3	+0.7788	0.5748	0.0161	+65	+ 5
26 Ophiuchi	5.8	3.11	6.6	24 51.9	19 18.7	- 7 43.6	+0.6680	0.5748	0.0159	+59	- 2
137 B. Ophiuchi	6.3	3.18	5.8	25 9.3	20 0 20.8	- 2 52.8	+0.9234	0.5759	-0.0034	+65	+15
39 Ophiuchi	5.1	+3.18	- 5.1	-24 11.9	2 46.1	- 0 32.9	-0.0845	0.5764	+0.0026	+10	-45
θ Ophiuchi	3.4	3.22	5.0	24 55.2	4 25.0	+ 1 2.2	+0.6805	0.5767	0.0067	+60	- 1
191 B. Ophiuchi	6.3	3.22	4.5	24 10.2	5 42.7	+ 2 17.0	-0.0965	0.5768	0.0099	+10	-46
b Ophiuchi	4.3	3.22	4.5	24 6.1	6 14.3	+ 2 47.4	-0.1628	0.5769	0.0112	+ 7	-50
51 Ophiuchi	4.8	3.24	4.0	23 54.0	8 20.0	+ 4 48.6	-0.3445	0.5772	0.0165	- 2	-62
63 Ophiuchi	6.1	+3.39	- 2.5	-24 52.3	18 2.2	- 9 51.0	+0.9502	0.5778	+0.0408	+65	+17
4 Sagittarii	4.8	3.39	1.8	23 48.6	20 4.5	- 7 53.5	-0.0722	0.5779	0.0458	+15	-44
21 G. Sagittarii	5.7	3.37	1.2	22 46.8	20 57.9	- 7 2.1	-1.1065	0.5780	0.0480	-46	-90
7 Sagittarii	5.5	3.42	1.6	24 17.0	21 19.9	- 6 40.9	+0.4812	0.5779	0.0490	+47	-13
9 Sagittarii	6.0	3.43	1.6	24 21.8	21 45.2	- 6 16.5	+0.5864	0.5778	0.0500	+55	- 7
1 Sagittarii	5.2	+3.45	- 0.7	-23 43.2	21 1 0.5	- 3 8.6	+0.0894	0.5778	+0.0580	+25	-35
24 Sagittarii	5.7	3.57	+ 1.0	24 5.7	10 10.6	+ 5 40.8	+1.1135	0.5770	0.0804	+66	+31
117 B. Sagittarii	5.8	3.58	1.6	23 34.6	12 6.0	+ 7 31.9	+0.7333	0.5767	0.0851	+66	+ 2
26 Sagittarii	6.1	3.61	1.7	23 54.7	13 29.0	+ 8 51.7	+1.2002	0.5765	0.0883	+66	+41
28 Sagittarii	5.6	3.59	2.6	22 28.8	15 22.0	+10 40.5	-0.1143	0.5762	0.0928	+17	-47
30 Sagittarii	6.2	+3.61	+ 3.1	-22 15.4	17 14.5	-11 31.2	-0.1661	0.5759	+0.0972	+15	-50
33 Sagittarii	5.8	3.60	3.6	21 27.7	18 34.0	-10 14.6	-0.8597	0.5757	0.1003	-23	-90
γ ¹ Sagittarii	5.0	3.64	3.2	22 50.8	18 37.0	-10 11.7	-0.5807	0.5757	0.1005	+58	- 7
γ ² Sagittarii	5.1	3.65	3.3	22 46.5	19 0.5	- 9 49.2	+0.5454	0.5756	0.1014	+56	-10
154 B. Sagittarii	5.9	3.66	3.2	23 16.8	19 22.6	- 9 27.8	+1.1050	0.5755	0.1022	+67	+29
ξ Sagittarii	3.7	+3.62	+ 4.0	-21 12.9	20 7.4	- 8 44.7	-0.9534	0.5754	+0.1040	-29	-90
168 B. Sagittarii	6.3	3.68	3.9	22 48.7	21 43.6	- 7 12.1	-0.8669	0.5751	0.1076	+67	+10
ο Sagittarii	3.9	3.67	4.4	21 51.8	23 0.7	- 5 57.9	+0.0261	0.5748	0.1106	+26	-39
π Sagittarii	3.0	3.67	5.1	21 9.3	23 1 8.9	- 3 54.4	-0.4631	0.5743	0.1154	+ 1	-71
199 B. Sagittarii	6.4	3.70	5.1	21 47.7	2 16.1	- 2 49.7	+0.3286	0.5741	0.1179	+44	-22
50 Sagittarii	5.5	+3.78	+ 6.3	-21 56.4	8 4.7	+ 2 46.0	+1.1983	0.5726	+0.1307	+68	+38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
253 B. Sagittarii	6.1	+3.79	+6.9	-21 29.0	22 10 0.9	+4 37.9	+0.9853	0.5722	+0.1349	+69	+18
266 B. Sagittarii	6.1	3.75	8.2	19 2.1	12 23.0	+6 54.7	-1.2067	0.5715	0.1399	-47	-90
f Sagittarii	5.1	3.81	8.7	19 57.5	16 34.6	+10 57.2	+0.3481	0.5703	0.1486	+48	-21
57 Sagittarii	6.0	3.83	9.5	19 15.2	19 3.6	-10 39.2	+0.0003	0.5696	0.1536	+29	-40
31 B. Capricorni	6.4	3.91	13.9	16 0.8	23 10 45.6	+4 28.6	-0.6621	0.5648	0.1827	-3	-88
27 G. Capricorni	6.2	+3.90	+14.2	-15 19.9	11 47.0	+5 27.7	-1.1682	0.5645	+0.1844	-37	-90
47 B. Capricorni	6.2	3.97	14.1	16 48.5	13 41.8	+7 18.5	+0.6905	0.5640	0.1876	+73	-2
r Capricorni	5.2	3.94	15.0	15 14.5	15 20.3	+8 53.4	-0.5905	0.5635	0.1903	+2	-80
61 B. Capricorni	5.9	3.97	14.8	16 25.0	15 52.8	+9 24.8	+0.7054	0.5634	0.1913	+74	-1
95 B. Capricorni	5.9	4.01	16.7	14 48.0	23 49.4	-6 55.6	+0.6313	0.5611	0.2034	+72	-6
53 B. Aquarii	6.5	+4.06	+18.4	-13 32.5	24 7 26.4	+0 25.4	+0.9465	0.5592	+0.2138	+76	+13
72 B. Aquarii	6.5	4.08	19.9	11 55.4	12 52.1	+5 39.7	+0.4904	0.5579	0.2205	+65	-14
137 B. Capricorni	6.2	4.11	21.0	10 56.7	17 52.3	+10 29.4	+0.6215	0.5569	0.2261	+75	-7
c ¹ Capricorni	5.3	4.10	21.9	9 27.5	20 21.0	-11 7.0	-0.3110	0.5565	0.2287	+21	-58
c ² Capricorni	6.3	4.11	21.9	9 39.2	20 54.8	-10 34.4	+0.0145	0.5564	0.2292	+38	-39
30 Aquarii	5.6	+4.14	+23.8	-6 55.0	25 4 31.9	+3 13.2	-0.9590	0.5553	+0.2361	-14	-90
44 Aquarii	5.7	4.18	24.9	5 47.7	10 44.8	+2 47.0	-0.6002	0.5546	0.2408	+7	-80
51 Aquarii	5.8	4.20	25.4	5 15.0	13 53.7	+5 49.3	-0.3836	0.5545	0.2428	+19	-63
κ Aquarii	5.2	4.24	26.2	4 39.0	20 2.2	+11 45.2	+0.5169	0.5543	0.2461	+71	-13
207 B. Aquarii	6.3	4.25	26.6	3 58.7	21 24.4	-10 55.5	+0.1844	0.5543	0.2467	+50	-30
6 G. Piscium	6.2	+4.31	+27.5	-2 49.9	26 5 15.9	-3 20.1	+0.9890	0.5545	+0.2493	+87	+15
8 Piscium	6.3	4.30	28.4	0 15.1	6 20.4	-2 17.8	-1.3165	0.5546	0.2495	-44	-88
22 B. Piscium	6.4	4.39	29.0	0 9.4	16 36.9	+7 37.5	+1.1582	0.5557	0.2503	+90	+27
κ Piscium	4.9	4.40	29.2	+0 48.6	18 8.3	+9 5.7	+0.5780	0.5560	0.2502	+77	-10
9 Piscium	6.4	4.39	29.2	0 40.5	18 16.9	+9 14.0	+0.7474	0.5560	0.2501	+90	0
16 Piscium	5.7	+4.42	+29.7	+1 39.0	22 22.5	-10 48.8	+0.7995	0.5567	+0.2495	+90	+3
19 Piscium	5.4	4.46	30.0	3 2.1	27 2 50.0	-6 30.6	+0.5312	0.5576	0.2484	+74	-12
36 Piscium	6.2	4.58	30.9	7 47.3	16 11.0	+6 22.4	-0.9199	0.5611	0.2418	-10	-82
d Piscium	5.4	4.59	30.9	7 44.3	17 57.2	+8 4.8	-0.4432	0.5617	0.2406	+17	-65
136 B. Piscium	6.5	4.67	30.6	8 54.6	28 2 57.0	-7 14.5	+0.5226	0.5647	0.2332	+73	-10
75 Piscium	6.3	+4.80	+30.4	+12 31.2	13 52.2	+3 17.2	-0.5894	0.5687	+0.2212	+8	-72
7 Piscium	3.7	4.92	29.4	14 55.6	29 0 27.2	-10 30.8	-0.7261	0.5728	0.2067	+1	-75
101 Piscium	6.2	4.92	29.1	14 14.7	2 16.1	-8 45.9	+0.3272	0.5736	0.2040	+60	-17
105 Piscium	6.1	4.97	29.0	15 59.6	3 53.8	-7 11.9	-1.0909	0.5742	0.2014	-24	-74
4 Arietis	5.8	5.00	28.5	16 33.0	7 27.5	-3 46.1	-0.9431	0.5756	0.1966	-13	-73
z Arietis	5.1	+5.06	+27.9	+17 25.2	11 16.6	-0 5.4	-1.0815	0.5771	+0.1890	-24	-73
35 B. Arietis	6.4	5.07	27.5	17 51.8	13 55.0	+2 27.0	-1.0331	0.5780	0.1843	-20	-72
47 B. Arietis	6.5	5.08	27.2	17 38.5	15 35.8	+4 4.1	-0.5050	0.5786	0.1812	+13	-61
20 H ¹ . Arietis	6.4	5.08	27.0	16 50.6	16 16.0	+4 42.9	+0.4186	0.5789	0.1799	+66	-10
26 Arietis	6.2	5.19	25.4	19 29.7	30 0 59.3	-10 53.7	-0.7545	0.5818	0.1627	-2	-71
μ Arietis	5.7	+5.22	+24.4	+19 39.9	5 46.5	-6 17.5	-0.1727	0.5832	+0.1526	+30	-38
47 Arietis	5.8	5.28	22.9	20 20.6	12 8.6	-0 9.9	+0.0692	0.5849	0.1385	+44	-23
e Arietis (mean)	4.6	5.28	22.8	21 0.9	12 36.1	+0 16.5	-0.5487	0.5850	0.1375	+10	-59
ζ Arietis	5.0	5.30	21.2	20 44.6	18 56.4	+6 22.2	+0.5524	0.5862	0.1227	+78	+3
r Arietis	5.2	5.31	20.6	20 51.3	21 29.1	+8 49.0	+0.7451	0.5866	0.1167	+90	+15
63 Arietis	5.2	+5.30	+20.5	+20 27.1	22 6.4	+9 24.8	+1.2270	0.5867	+0.1152	+88	+52
65 Arietis	6.0	5.30	20.4	20 30.9	22 46.8	+10 3.7	+1.2398	0.5868	0.1135	+86	+54
66 Arietis	6.1	5.37	19.7	22 31.5	81 0 22.1	+11 35.4	-0.6288	0.5870	0.1097	+4	-62
23 Tauri	4.3	5.42	17.6	23 41.7	7 31.9	-5 31.5	-1.1058	0.5875	0.0919	-30	-66
7 Tauri	3.0	5.43	17.5	23 51.3	7 59.6	-5 4.8	-1.2262	0.5875	0.0907	-45	-66
104 B. Tauri	5.5	+5.41	+17.5	+23 10.3	8 20.9	-4 44.3	-0.4962	0.5875	+0.0899	+12	-52

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	'	d h m	h m				.	.
27 Tauri	3.7	+5.43	+17.3	+23 48.3	31 8 40.0	-4 26.0	-1.1161	0.5876	+0.0891	-31	-66
28 Tauri	5.2	5.43	17.3	23 53.3	8 40.5	-4 25.5	-1.2008	0.5875	0.0890	-41	-66
133 B. Tauri	5.9	5.37	17.4	21 59.8	8 53.6	-4 7.1	+0.7636	0.5876	0.0882	+90	+19
32 Tauri	5.8	5.38	16.6	22 14.7	11 46.4	-1 26.8	+0.7472	0.5875	0.0812	+90	+18
33 Tauri	6.0	5.40	16.6	22 56.4	11 50.8	-1 22.6	+0.0398	0.5875	0.0810	+42	-20
161 B. Tauri	6.5	+5.40	+16.1	+22 58.3	13 24.3	+0 7.3	+0.1299	0.5875	+0.0770	+48	-14
36 Tauri	5.6	5.44	15.6	23 53.0	14 45.7	+1 25.5	-0.7029	0.5874	0.0735	0	-65
192 B. Tauri	6.1	5.37	14.8	22 12.3	18 11.4	+4 43.3	+1.2505	0.5872	0.0647	+78	+62
62 Tauri	6.1	5.43	13.2	24 6.7	22 53.5	+9 0.0	-0.4424	0.5866	0.0532	+15	-45
v Tauri	4.2	5.38	13.2	22 37.8	23 35.2	+9 54.6	+1.1368	0.5865	0.0507	+90	+49
72 Tauri	5.4	+5.38	+13.0	+22 48.8	23 59.1	+10 17.5	+0.9671	0.5864	+0.0497	+90	+35

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284 B. Tauri	6.0	+5.39	+11.8	+23 10.5	1 3 40.8	-10 9.4	+0.7614	0.5857	+0.0401	+90	+23
r Tauri	4.3	+5.36	+11.2	+22 48.1	6 0.8	-7 54.7	+1.2361	0.5852	+0.0340	+83	+60
95 Tauri	6.2	5.40	10.9	23 56.1	6 23.7	-7 32.7	+0.0739	0.5851	0.0331	+44	-13
300 B. Tauri	6.2	5.38	10.7	23 28.8	7 24.2	-6 34.5	+0.5787	0.5848	0.0305	+82	+14
815 B. Tauri	6.3	5.41	9.2	24 27.8	11 40.1	-2 28.5	-0.3360	0.5835	0.0194	+21	-35
99 Tauri	6.0	5.38	9.1	23 49.3	12 18.4	-1 51.7	+0.3423	0.5834	0.0178	+62	+2
k Tauri	5.6	+5.42	+8.8	+24 55.5	12 25.8	-1 44.6	-0.8033	0.5833	+0.0174	-7	-65
103 Tauri	5.5	5.37	7.8	24 9.5	16 29.8	+2 10.2	+0.0445	0.5819	+0.0070	+43	-13
118 Tauri	5.4	5.36	4.9	25 5.1	2 10.6	+10 31.2	-0.9624	0.5783	-0.0149	-18	-65
121 Tauri	5.1	5.29	4.4	23 59.2	3 45.1	-11 0.0	+0.1437	0.5770	0.0213	+49	-9
394 B. Tauri	6.0	5.23	3.6	23 10.0	7 2.6	-7 49.9	+0.9232	0.5754	0.0294	+90	+34
132 Tauri	5.0	+5.27	+2.6	+24 32.5	9 24.1	-5 53.6	-0.6005	0.5741	-0.0351	+6	-55
412 B. Tauri	5.8	5.23	1.6	24 14.3	12 44.3	-2 20.8	-0.4128	0.5722	0.0431	+17	-42
1 Geminorum	4.3	5.16	0.9	23 16.1	15 47.7	+0 35.8	+0.4699	0.5704	0.0502	+72	+6
3 Geminorum	5.6	5.14	+0.4	23 7.7	18 11.2	+2 54.1	-0.4030	0.5690	0.0558	+74	+7
5 Geminorum	5.9	5.18	-0.3	24 26.4	18 56.1	+3 37.5	-0.9302	0.5685	0.0575	-16	-66
6 Geminorum	6.3	+5.12	+0.1	+22 55.7	19 17.6	+3 58.1	+0.6421	0.5683	-0.0583	+89	+14
7 Gemin. (var.)	3.2	5.09	-0.1	22 31.9	20 23.9	+5 2.0	+0.9973	0.5678	0.0608	+90	+36
8 Geminorum	6.1	5.14	0.7	23 59.9	20 59.4	+5 36.3	-0.5043	0.5672	0.0622	+6	-57
9 Geminorum	6.2	5.13	0.7	23 46.2	21 16.6	+5 52.8	-0.3706	0.5670	0.0623	+19	-41
μ Geminorum	3.2	5.06	1.2	22 33.4	23 52.2	+8 22.9	+0.7477	0.5654	0.0686	+90	+19
36 B. Geminorum	6.0	+5.08	-1.6	+23 22.4	3 05.8	+9 27.0	-0.1983	0.5647	-0.0710	+29	-32
d Geminorum	5.2	4.90	4.4	21 51.5	12 25.1	-3 30.9	+0.4673	0.5568	0.0951	+71	+1
ζ Gemin. (var.)	3.7	4.79	5.4	20 41.5	18 3.9	+1 56.3	+1.1527	0.5528	0.1063	+90	+44
44 Geminorum	5.9	4.86	6.2	22 45.7	18 34.4	+2 25.7	-1.1246	0.5525	0.1072	-31	-67
120 B. Geminorum	6.5	4.78	6.7	21 23.5	20 47.0	+4 33.8	+0.1061	0.5509	0.1114	+46	-19
δ Geminorum	3.5	+4.75	-7.7	+22 8.0	4 1 20.5	+8 58.2	-1.2227	0.5476	-0.1198	-42	-68
56 Geminorum	5.2	4.68	7.4	20 36.0	2 12.4	+9 48.3	-0.3279	0.5469	0.1213	+60	-9
149 B. Geminorum	6.4	4.68	8.3	21 42.0	4 27.8	+11 59.2	-1.1390	0.5453	0.1253	-32	-68
61 Geminorum	5.8	4.66	7.9	20 25.3	4 30.9	-11 57.8	+0.2346	0.5452	0.1254	+54	-15
63 Geminorum	5.3	4.69	8.5	21 36.8	4 52.3	-11 37.2	-1.0972	0.5450	0.1260	-28	-68
79 Geminorum	6.3	+4.55	-9.9	+20 30.8	13 3.6	-3 42.1	-0.9989	0.5391	-0.1396	-19	-69
g Geminorum	5.0	4.48	9.4	18 42.7	13 93.0	-3 13.5	+0.8874	0.5388	0.1404	+90	+20
209 B. Geminorum	6.2	4.48	10.3	19 32.1	16 18.7	-0 33.2	-0.4013	0.5368	0.1447	+18	-52
85 Geminorum	5.2	4.47	10.9	20 6.1	18 5.0	+1 9.7	-1.2751	0.5356	0.1475	-48	-70
3 Cancri	5.7	4.37	10.5	17 32.0	20 35.5	+3 35.4	+1.1417	0.5338	0.1512	+90	+38
10 H. Cancri	6.1	+4.38	-11.4	+19 4.5	22 29.6	+5 25.9	-0.8246	0.5325	-0.1539	-7	-71

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
ζ Cancr (<i>mean</i>)	4.7	+4.31	-11.8	+17 53.7	d 5 2 8.8	+ 8 58.2	-0.1129	0.5300	-0.1591	+34	-37
d^2 Cancr	6.2	4.19	13.0	17 19.0	8 54.1	- 8 29.0	-0.5869	0.5256	0.1630	+ 8	-67
90 B. Cancr	6.3	4.10	13.2	15 35.0	14 4.9	- 3 27.7	+0.4081	0.5224	0.1743	+65	-12
54 Cancr	6.3	3.99	14.4	15 39.3	21 40.2	+ 3 53.8	-1.0112	0.5180	0.1828	-13	-74
209 B. Cancr	6.5	3.80	14.7	11 53.9	6 7 26.1	-10 37.4	+1.2865	0.5129	0.1925	+88	+47
222 B. Cancr	6.3	+3.76	-15.2	+11 50.7	11 41.1	- 6 29.8	+0.5204	0.5108	-0.1963	+73	- 9
ξ Leonis	5.1	3.65	16.2	11 39.8	19 10.3	+ 0 46.5	-0.7718	0.5076	0.2023	- 2	-78
h Leonis	5.2	3.64	15.6	10 4.7	19 11.6	+ 0 47.6	+0.9746	0.5076	0.2023	+90	+17
o Leonis	3.8	3.57	16.3	10 16.0	7 0 7.7	+ 5 35.4	-0.2402	0.5057	0.2059	+27	-51
83 B. Leonis	5.9	3.46	16.8	9 19.3	8 24.6	-10 21.7	-0.9247	0.5031	0.2111	-11	-81
89 B. Leonis	6.2	+3.45	-16.7	+ 8 42.4	9 20.0	- 9 27.8	-0.4381	0.5028	-0.2117	+17	-64
π Leonis	4.0	3.43	16.8	8 26.3	10 28.5	- 8 21.2	-0.3840	0.5024	0.2123	+20	-60
155 B. Leonis	6.5	3.26	17.2	6 6.7	23 8.9	+ 3 58.1	-0.5374	0.4998	0.2153	+12	-72
237 B. Leonis	6.3	3.08	16.9	1 27.6	8 15 13.1	- 4 24.0	+1.0642	0.4984	0.2229	+90	+20
55 Leonis	6.1	3.07	16.9	1 10.5	17 8.7	- 2 31.5	+0.9504	0.4984	0.2232	+90	+12
p^3 Leonis	6.1	+3.02	-16.9	+ 0 26.5	21 32.6	+ 1 45.2	+0.7785	0.4985	-0.2239	+90	+ 2
p^6 Leonis	5.3	2.97	17.3	+ 0 22.6	9 3 10.5	+ 7 13.7	-0.4123	0.4909	0.2243	-18	-65
388 B. Leonis	6.3	2.90	17.1	- 1 14.0	11 0.2	- 9 9.4	-0.3708	0.4909	0.2242	+20	-62
e Leonis	5.1	2.89	16.8	2 33.0	12 20.4	- 7 51.3	+0.7682	0.5002	0.2241	+87	+ 1
431 B. Leonis	6.2	2.85	17.1	1 58.9	16 47.8	- 3 31.3	-0.8567	0.5010	0.2236	- 7	-90
13 B. Virginis	5.9	+2.80	-16.6	- 4 52.6	23 43.7	+ 3 13.2	+0.7912	0.5028	-0.2224	+85	+ 2
64 B. Virginis	6.5	2.73	16.2	7 19.0	10 16.6	-10 31.6	+1.1477	0.5061	0.2192	+83	+27
q Virginis	5.3	2.66	16.0	8 59.9	22 44.9	+ 1 35.5	+0.2934	0.5113	0.2133	+54	-24
370 B. Virginis	6.0	2.62	15.5	11 12.2	11 9 30.5	-11 57.7	+0.4469	0.5166	0.2063	+63	-16
75 Virginis	5.6	2.58	14.4	14 56.4	12 5 4.1	+ 7 0.7	+0.6408	0.5281	-0.1887	+72	- 5
NEW MOON.											
39 Ophiuchi	5.1	+3.00	- 4.0	-24 11.9	16 8 44.2	+ 7 12.5	+0.0532	0.5825	+0.0041	+18	-37
θ Ophiuchi	3.4	3.03	3.9	24 55.1	10 21.5	+ 8 46.1	+0.8158	0.5827	0.0083	+65	+ 8
191 B. Ophiuchi	6.3	3.03	3.5	24 10.2	11 38.0	+ 9 59.7	+0.0455	0.5829	0.0115	+18	-37
b Ophiuchi	4.3	+3.03	- 3.5	-24 6.1	12 9.1	+10 29.8	-0.0197	0.5830	+0.0128	+15	-41
51 Ophiuchi	4.8	3.04	3.0	23 54.0	14 13.0	-11 31.2	-0.1974	0.5831	0.0181	+ 6	-52
63 Ophiuchi	6.1	3.14	1.5	24 52.3	23 46.8	- 2 19.1	+1.1035	0.5833	0.0425	+65	+31
4 Sagittarii	4.8	3.13	1.0	23 48.6	17 1 47.5	- 0 23.1	+0.0890	0.5833	0.0476	+23	-35
21 G. Sagittarii	5.7	3.12	0.6	22 46.8	2 40.2	+ 0 27.6	-0.9390	0.5832	0.0498	-33	-90
7 Sagittarii	5.5	+3.15	- 0.8	-24 17.0	3 1.9	+ 0 48.5	+0.6413	0.5831	+0.0507	+59	- 3
9 Sagittarii	6.0	3.16	- 0.7	24 21.8	3 26.9	+ 1 12.5	+0.7465	0.5831	0.0517	+66	+ 3
1 Sagittarii	5.2	3.17	0.0	23 43.2	6 39.7	+ 4 18.0	+0.2561	0.5828	0.0598	+34	-25
117 B. Sagittarii	5.8	3.26	+ 2.1	23 34.6	17 38.2	- 9 8.5	+0.9110	0.5809	0.0867	+66	+14
28 Sagittarii	5.6	3.27	3.0	22 28.7	20 52.5	- 6 1.5	+0.0696	0.5801	0.0945	+27	-36
30 Sagittarii	6.2	+3.27	+ 3.4	-22 15.4	22 44.1	- 4 14.2	+0.0199	0.5796	+0.0988	+24	-39
33 Sagittarii	5.8	3.27	3.8	21 27.7	0 3.1	+ 25.2	-0.6696	0.5792	0.1019	-12	-90
ν^1 Sagittarii	5.0	3.30	3.5	22 50.8	0 6.0	- 2 55.3	+0.7662	0.5792	0.1020	+67	+ 4
ν^2 Sagittarii	5.1	3.31	3.6	22 46.5	0 29.4	- 2 32.9	+0.7315	0.5791	0.1029	+67	+ 2
154 B. Sagittarii	5.9	3.32	3.5	23 16.8	0 51.3	- 2 11.7	+1.2901	0.5790	0.1038	+66	+60
36 Sagittarii	5.1	+3.26	+ 4.3	-20 45.9	1 26.6	- 1 37.9	-1.2443	0.5788	+0.1051	-55	-85
ξ Sagittarii	3.7	3.28	4.2	21 12.9	1 35.7	- 1 29.0	-0.7628	0.5788	0.1055	-17	-90
168 B. Sagittarii	6.3	3.33	4.1	22 48.7	3 11.3	+ 0 2.9	+1.0553	0.5783	0.1091	+87	+25
o Sagittarii	3.9	3.32	4.5	21 51.8	4 27.9	+ 1 16.7	+0.2174	0.5779	0.1121	+37	-28
π Sagittarii	3.0	3.32	5.2	21 9.3	6 35.4	+ 3 19.4	-0.2690	0.5772	0.1169	+11	-56
199 B. Sagittarii	6.4	+3.35	+ 5.2	-21 47.7	7 42.3	+ 4 23.8	+0.5227	0.5768	+0.1193	+56	-11

ELEMENTS FOR THE PREDICTION OF OCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallax.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	γ'	α'	δ'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	$"$	$^{\circ}$ $'$	d h m	h m				$^{\circ}$ $'$	$^{\circ}$ $'$
253 B. Sagittarii	6.1	+3.41	+6.8	-21 29.0	18 15 25.4	+11 49.8	+1.1862	0.5740	+0.1360	+69	+37
266 B. Sagittarii	6.1	3.38	7.9	19 2.1	17 47.3	-9 53.7	-1.0038	0.5731	0.1409	-29	-90
f Sagittarii	5.1	3.43	8.4	19 57.6	21 58.8	-5 51.4	+0.5546	0.5714	0.1494	+61	-9
57 Sagittarii	6.0	3.44	9.1	19 15.2	19 0 27.9	-3 27.6	+0.2063	0.5703	0.1543	+41	-28
31 B. Capricorni	6.4	3.52	13.0	16 0.8	16 13.7	+11 44.1	-0.4484	0.5636	0.1825	+9	-68
27 G. Capricorni	6.2	+3.50	+13.4	-15 19.9	17 15.6	-11 16.3	-0.9561	0.5632	+0.1842	-21	-90
47 B. Capricorni	6.2	3.57	13.2	16 48.5	19 11.3	-9 24.7	+0.9109	0.5623	0.1873	+73	+12
r Capricorni	5.2	3.54	14.1	15 14.6	20 50.7	-7 48.8	-0.3752	0.5616	0.1898	+14	-63
61 B. Capricorni	5.9	3.57	13.8	16 25.0	21 23.5	-7 17.1	+0.9269	0.5614	0.1907	+74	+12
95 B. Capricorni	5.9	3.62	15.6	14 48.0	20 5 25.2	+0 27.7	+0.8549	0.5582	0.2023	+75	+8
v Aquarii	4.5	+3.61	+17.4	-11 42.2	10 17.8	+5 10.1	-1.2973	0.5563	+0.2087	-48	-86
53 B. Aquarii	6.5	3.67	17.2	13 32.5	13 8.7	+7 55.1	+1.1737	0.5552	0.2121	+76	+31
72 B. Aquarii	6.3	3.69	18.6	11 55.4	18 39.7	-10 45.3	+0.7140	0.5534	0.2184	+78	-1
137 B. Capricorni	6.2	3.72	19.6	10 56.7	23 45.3	-5 50.1	+0.8457	0.5518	0.2236	+79	+6
c ¹ Capricorni	5.3	3.73	20.5	9 27.5	21 2 17.0	-3 23.6	-0.0963	0.5510	0.2260	+32	-45
c ² Capricorni	6.3	+3.74	+20.5	-9 39.2	2 51.5	-2 50.3	+0.2321	0.5509	+0.2265	+51	-28
30 Aquarii	5.6	3.78	22.5	6 55.1	10 38.5	+4 40.9	-0.7552	0.5490	0.2329	-2	-90
44 Aquarii	5.7	3.83	23.6	5 47.7	17 0.2	+10 49.9	-0.3967	0.5478	0.2371	+18	-64
51 Aquarii	5.8	3.86	24.1	5 15.0	20 13.9	-10 3.0	-0.1800	0.5473	0.2389	+30	-50
187 B. Aquarii	6.3	3.86	25.1	3 19.8	23 33.6	-6 49.9	-1.3268	0.5469	0.2405	-47	-86
κ Aquarii	5.2	+3.91	+24.8	-4 39.0	22 2 32.1	-3 57.4	+0.7265	0.5466	+0.2417	+85	-1
207 B. Aquarii	6.3	3.92	25.2	3 58.7	3 56.5	-2 35.8	+0.3336	0.5465	0.2423	+62	-20
6 G. Piscium	6.2	4.00	26.2	2 50.0	12 1.4	+5 12.9	+1.1963	0.5462	0.2444	+87	+31
3 Piscium	6.3	4.00	27.2	0 15.2	13 7.8	+6 17.1	-1.1419	0.5462	0.2446	-26	-00
22 B. Piscium	6.4	4.12	27.8	0 9.4	23 42.9	-7 28.9	+1.3550	0.5469	0.2450	+81	+50
κ Piscium	4.9	+4.14	+28.1	+0 48.5	23 1 17.2	-5 57.8	+0.7643	0.5470	+0.2448	+90	+1
9 Piscium	6.4	4.14	28.1	0 40.5	1 26.0	-5 49.4	+0.9360	0.5470	0.2448	+90	+12
16 Piscium	5.7	4.17	28.7	1 39.0	5 39.2	-1 44.5	+0.9832	0.5477	0.2441	+90	+15
19 Piscium	5.4	4.23	29.1	3 2.1	10 15.1	+2 42.2	+0.7046	0.5485	0.2429	+90	-2
ω Piscium	4.0	4.31	30.1	6 24.7	16 9.8	+8 25.0	-1.2763	0.5498	0.2406	-39	-84
36 Piscium	6.2	+4.40	+30.5	+7 47.3	24 0 1.5	-7 59.4	-0.7899	0.5520	+0.2363	-3	-82
d Piscium	5.4	4.43	30.5	7 44.3	1 61.0	-6 13.6	-0.3091	0.5525	0.2351	+23	-56
136 B. Piscium	6.5	4.55	30.3	8 54.6	11 7.5	+2 43.9	+0.6547	0.5558	0.2278	+36	-3
75 Piscium	6.3	4.74	30.6	12 31.2	22 22.2	-10 24.9	-0.4937	0.5603	0.2162	+14	-65
η Piscium	3.7	4.92	29.9	14 55.6	25 9 14.8	+0 4.6	-0.6524	0.5652	0.2021	+5	-73
101 Piscium	6.2	+4.93	+29.5	+14 14.7	11 6.4	+1 52.3	+0.4109	0.5660	+0.1994	+65	-12
105 Piscium	6.1	4.99	29.6	15 59.6	12 46.7	+3 28.9	-1.0283	0.5668	0.1970	-20	-74
4 Arietis	5.8	5.04	29.2	16 33.1	16 25.7	+7 0.0	-0.8852	0.5685	0.1913	-10	-73
z Arietis	5.1	5.11	28.8	17 25.2	20 20.3	+10 46.1	-1.0323	0.5703	0.1850	-20	-73
35 B. Arietis	6.4	5.15	28.4	17 51.8	23 2.3	-10 37.7	-0.9882	0.5715	0.1803	-17	-72
47 B. Arietis	6.5	+5.17	+28.1	+17 38.5	26 0 45.4	-8 58.4	-0.4573	0.5723	+0.1773	+15	-58
20 H ¹ Arietis	6.4	5.17	27.6	16 50.6	1 26.5	-8 18.8	+0.4752	0.5726	0.1761	+70	-6
26 Arietis	6.2	5.34	26.5	19 29.7	10 20.5	+0 15.4	-0.7269	0.5765	0.1594	-1	-71
μ Arietis	5.7	5.40	25.4	19 39.9	15 12.8	+4 56.9	-0.1485	0.5785	0.1495	+32	-37
47 Arietis	5.8	5.51	24.0	20 20.6	21 41.1	+11 10.6	-0.0833	0.5809	0.1357	+45	-23
ϵ Arietis (mean)	4.6	+5.52	+24.0	+21 0.9	22 9.0	+11 37.4	-0.5404	0.5811	+0.1347	+10	-59
ζ Arietis	5.0	5.57	22.2	20 44.6	27 4 34.5	-6 11.7	+0.5572	0.5831	0.1203	+79	+4
τ Arietis	5.2	5.61	21.6	20 51.3	7 8.9	+3 43.1	+0.7462	0.5839	0.1143	+90	+15
63 Arietis	5.2	5.59	21.4	20 27.1	7 46.6	-3 6.9	+1.2302	0.5840	0.1128	+88	+53
65 Arietis	6.0	5.60	21.2	20 30.9	8 27.5	-2 27.5	+1.2417	0.5842	0.1112	+86	+55
66 Arietis	6.1	+5.69	+20.8	+22 31.5	10 3.8	-0 54.9	-0.6417	0.5846	+0.1074	+4	-63

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S						AT CONJUNCTION IN R. A.						Limiting Par- allels.	
Name.		Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
			$\Delta\alpha$	$\Delta\delta$									
23	Tauri	4.3	+5.80	+18.9	+23 41.8	27 17 17.5	+ 6 2.1	-1.1332	0.5860	+0.0899	-33	-66	
η	Tauri	3.0	5.81	18.7	23 51.3	17 45.4	+ 6 29.1	-1.2549	0.5861	0.0888	-50	-66	
104 B.	Tauri	5.5	5.79	18.6	23 10.3	18 6.8	+ 6 49.6	-0.5220	0.5862	0.0879	+10	-53	
27	Tauri	3.7	5.81	18.5	23 48.3	18 26.1	+ 7 8.2	-1.1453	0.5862	0.0871	-34	-66	
28	Tauri	5.2	5.82	18.5	23 53.4	18 26.7	+ 7 8.7	-1.2304	0.5862	0.0871	-46	-66	
133 B.	Tauri	5.9	+5.75	+18.3	+21 59.9	18 45.8	+ 7 27.1	+0.7428	0.5863	+0.0863	+90	+18	
32	Tauri	5.8	5.78	17.5	22 14.7	21 33.8	+10 8.6	+0.7212	0.5866	0.0793	+90	+17	
33	Tauri	6.0	5.80	17.6	22 56.4	21 38.2	+10 12.9	+0.0105	0.5866	0.0791	+40	-21	
161 B.	Tauri	6.5	5.82	17.0	22 58.4	23 12.2	+11 43.3	+0.0983	0.5868	0.0752	+46	-16	
36	Tauri	5.6	5.86	16.6	23 53.0	28 0 34.0	-10 58.1	-0.7400	0.5869	0.0718	-3	-66	
192 B.	Tauri	6.1	+5.81	+15.6	+22 12.3	4 0.7	- 7 39.4	+1.2233	0.5870	+0.0630	+86	+57	
62	Tauri	6.1	5.92	14.1	24 6.7	8 28.6	- 3 21.9	-0.4912	0.5870	0.0516	+12	-48	
ν	Tauri	4.2	5.86	13.8	22 37.8	9 25.4	- 2 27.1	+1.0904	0.5870	0.0491	+90	+45	
72	Tauri	5.4	5.87	13.7	22 48.8	9 49.3	- 2 4.2	+0.9195	0.5870	0.0481	+90	+32	
284 B.	Tauri	6.0	5.91	12.4	23 10.5	13 31.3	+ 1 29.2	+0.7068	0.5867	0.0386	+90	+20	
r	Tauri	4.3	+5.89	+11.7	+22 48.1	15 51.4	+ 3 43.8	+1.1782	0.5864	+0.0325	+90	+54	
95	Tauri	6.2	5.94	11.5	23 56.1	16 14.2	+ 4 5.8	+0.0138	0.5864	0.0315	+41	-17	
300 B.	Tauri	6.2	5.92	11.2	23 28.8	17 14.7	+ 5 4.0	+0.5176	0.5862	0.0289	+76	+10	
315 B.	Tauri	6.3	5.98	9.7	24 27.8	21 30.2	+ 9 9.7	-0.4047	0.5855	0.0179	+17	-40	
99	Tauri	6.0	5.95	9.5	23 49.3	22 8.4	+ 9 46.4	+0.2731	0.5854	0.0163	+57	-1	
k	Tauri	5.6	+6.00	+ 9.4	+24 55.5	22 15.8	+ 9 53.5	-0.8734	0.5853	+0.0160	-12	-65	
103	Tauri	5.5	5.97	8.1	24 9.5	29 2 19.1	-10 12.6	-0.0313	0.5843	+0.0055	+38	-16	
118	Tauri	5.4	6.01	5.0	25 5.1	10 57.2	- 1 54.1	-1.0498	0.5815	-0.0164	-26	-65	
121	Tauri	5.1	5.95	4.2	23 59.2	13 30.8	+ 0 33.7	+0.0512	0.5805	0.0228	+43	-14	
394 B.	Tauri	6.0	5.91	3.2	23 10.0	16 46.8	+ 3 42.4	+0.8246	0.5791	0.0309	+90	+28	
132	Tauri	5.0	+5.96	+ 2.3	+24 32.5	19 7.2	+ 5 57.6	-0.6992	0.5780	-0.0366	0	-64	
412 B.	Tauri	5.8	5.94	1.2	24 14.3	22 25.7	+ 9 8.5	-0.5163	0.5764	0.0447	+10	-49	
1	Geminorum	4.3	5.88	+ 0.2	23 16.1	30 1 27.3	-11 56.5	+0.3599	0.5748	0.0519	+63	0	
3	Geminorum	5.6	5.87	- 0.5	23 7.7	3 49.4	- 9 39.6	+0.3797	0.5735	0.0574	+64	0	
5	Geminorum	5.9	5.92	1.0	24 26.4	4 33.9	- 8 56.7	-1.0489	0.5731	0.0592	-25	-66	
6	Geminorum	6.3	+5.85	- 0.8	+22 55.7	4 55.2	- 8 36.3	+0.5268	0.5729	-0.0600	+76	+ 8	
η	Gemin. (var.)	3.2	5.82	1.2	22 31.9	6 0.7	- 7 33.1	+0.8793	0.5723	0.0625	+90	+28	
8	Geminorum	6.1	5.89	1.6	23 59.8	6 35.8	- 6 59.2	-0.7077	0.5719	0.0639	-1	-65	
9	Geminorum	6.2	5.88	1.6	23 46.2	6 52.9	- 6 42.8	-0.4851	0.5717	0.0645	+12	-49	
μ	Geminorum	3.2	5.81	2.4	22 33.4	9 26.8	- 4 14.5	+0.6260	0.5702	0.0703	+87	+12	
36 B.	Geminorum	6.0	+5.84	- 2.8	+23 22.4	10 32.6	- 3 11.1	-0.3179	0.5695	-0.0728	+22	-39	
d	Geminorum	5.2	+5.70	- 6.1	+21 51.5	21 50.5	+ 7 42.5	+0.3312	0.5621	-0.0971	+61	- 6	

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ζ	Gemin. (var.)	3.7	+5.61	- 7.6	+20 41.5	1 3 24.8	-10 54.8	+1.0069	0.5582	-0.1082	+90	+32
44	Geminorum	5.9	5.68	8.1	22 45.6	3 54.9	-10 25.8	-1.2598	0.5578	0.1092	-49	-67
120 B.	Geminorum	6.5	5.60	8.9	21 23.4	6 5.6	- 8 19.6	-0.0374	0.5563	0.1134	+38	-27
56	Geminorum	5.2	5.53	9.9	20 35.9	11 26.6	- 3 9.6	+0.1776	0.5524	0.1234	+51	-17
149 B.	Geminorum	6.4	5.53	10.8	21 42.0	13 40.0	- 1 0.7	-1.2838	0.5507	0.1274	-53	-68
61	Geminorum	5.8	+5.50	-10.5	+20 25.3	13 43.1	- 0 57.7	+0.0828	0.5507	-0.1275	+45	-22
63	Geminorum	5.3	5.54	10.9	21 36.8	14 4.1	- 0 37.4	-1.2426	0.5504	0.1281	-45	-68
79	Geminorum	6.3	5.42	12.8	20 30.8	22 8.4	+ 7 10.7	-1.1522	0.5445	0.1417	-32	-69
g	Geminorum	5.0	5.35	12.5	18 42.6	22 37.4	+ 7 38.0	+0.7233	0.5441	0.1425	+90	+10
209 B.	Geminorum	6.2	5.35	13.4	19 32.1	2 1 20.7	+10 16.8	-0.5607	0.5421	0.1468	+ 9	-62
3	Cancer	5.7	+5.24	-13.9	+17 32.0	5 33.9	- 9 38.3	+0.9705	0.5390	-0.1532	+90	+24

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Υ	Υ'	Υ''	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
10 H. Cancrī	6.1	+5.27	-14.8	+19 4.4	2 7 26.3	- 7 49.4	-0.9866	0.5376	-0.1560	-18	-71
5 Cancrī (<i>mean</i>)	4.7	5.20	15.4	17 53.7	11 2.5	- 420.2	-0.2810	0.5350	0.1611	+24	-46
2 ^a Cancrī	6.2	5.08	16.7	17 19.0	17 42.3	+ 2 7.1	-0.7577	0.5304	0.1699	- 2	-73
90 B. Cancrī	6.3	4.99	17.2	15 35.8	22 49.0	+ 7 4.2	+0.2289	0.5268	0.1762	+53	-21
54 Cancrī	6.3	4.90	18.6	15 39.2	3 6 13.7	- 9 39.8	-1.1874	0.5220	0.1845	-33	-74
209 B. Cancrī	6.5	+4.70	-19.4	+11 53.0	15 58.1	- 0 17.6	+1.0956	0.5163	-0.1940	+90	+28
222 B. Cancrī	6.3	4.65	20.0	11 50.6	20 10.6	+ 3 47.5	+0.3317	0.5139	0.1976	+59	-19
ξ Leonis	5.1	4.55	21.1	11 39.7	4 3 35.7	+10 50.6	-0.9572	0.5102	0.2034	-14	-78
h Leonis	5.2	4.53	20.5	10 4.6	3 36.9	+11 0.0	+0.7826	0.5102	0.2034	+90	+ 5
o Leonis	3.8	4.47	21.3	10 15.9	8 30.7	- 8 13.8	-0.4284	0.5080	0.2067	+17	-62
83 B. Leonis	5.9	+4.36	-22.0	+ 9 19.3	16 44.4	- 0 14.0	-1.1113	0.5047	-0.2117	-24	-81
89 B. Leonis	6.2	4.35	22.0	8 42.3	17 39.5	+ 0 39.5	-0.6261	0.5044	0.2122	+ 7	-78
π Leonis	4.9	4.33	22.0	8 26.2	18 47.7	+ 1 45.8	-0.5721	0.5040	0.2128	+10	-74
14 Sextantis	6.3	4.25	21.6	6 0.7	22 23.6	+ 5 15.7	+1.3372	0.5027	0.2145	+83	+50
155 B. Leonis	6.5	4.14	22.6	6 6.6	5 7 25.0	- 9 57.9	-0.7238	0.5003	0.2182	+ 1	-84
237 B. Leonis	6.3	+3.95	-22.2	+ 1 27.5	23 28.3	+ 5 39.0	+0.8813	0.4978	-0.2221	+90	+ 8
55 Leonis	6.1	3.93	22.2	1 10.4	6 1 24.0	+ 7 31.6	+0.7687	0.4976	0.2224	+90	+ 1
p ^a Leonis	6.1	3.87	22.2	0 26.4	5 48.3	+11 48.7	+0.5994	0.4975	0.2228	-79	- 8
p ^b Leonis	5.3	3.82	22.5	+ 0 22.6	11 26.9	- 6 42.0	-0.5879	0.4975	0.2231	+ 9	-78
388 B. Leonis	6.3	3.74	22.3	- 1 14.9	19 18.2	+ 0 56.5	-0.5413	0.4981	0.2227	+11	-74
e Leonis	5.1	+3.73	-21.9	- 2 33.1	20 38.7	+ 2 14.8	+0.5998	0.4983	-0.2226	+79	- 8
431 B. Leonis	6.2	3.69	22.2	1 50.0	7 1 7.3	+ 6 36.0	-1.0233	0.4939	0.2220	-18	-90
13 B. Virginis	5.9	3.62	21.4	4 52.7	8 5.4	-10 37.4	+0.6316	0.5004	0.2205	+81	- 6
64 B. Virginis	6.5	3.54	20.8	7 19.1	18 42.0	- 0 18.5	+0.9983	0.5034	0.2171	+83	+16
q Virginis	5.3	3.44	20.2	9 0.0	8 7 15.3	+11 53.5	+0.1557	0.5083	0.2111	+46	-32
370 B. Virginis	6.0	+3.38	-19.3	-11 12.2	18 5.1	- 1 35.2	+0.3212	0.5136	-0.2041	+55	-23
75 Virginis	5.6	3.28	17.5	14 56.5	9 13 45.6	- 6 20.0	+0.5983	0.5255	0.1867	+66	-11
83 Virginis	5.6	3.27	16.9	15 40.0	19 31.2	- 0 55.1	+0.3758	0.5295	0.1803	+54	-20
85 Virginis	6.1	3.26	17.0	15 21.3	20 3.6	- 0 23.7	-0.1671	0.5299	0.1797	+24	-50
214 G. Virginis	6.5	3.22	16.2	15 56.6	10 5 35.5	+ 8 50.2	-1.1860	0.5367	0.1678	-40	-90
43 H. Virginis	5.5	+3.22	-15.3	-17 49.1	10 25.3	-10 29.3	+0.6410	0.5404	-0.1611	+33	-38
231 G. Virginis	6.4	3.23	15.1	18 12.3	11 12.1	- 9 44.0	+0.3311	0.5410	0.1600	+49	-22
236 G. Virginis	5.7	3.22	15.1	18 20.2	11 56.7	- 9 0.8	+0.3541	0.5415	0.1539	+50	-21
9 G. Libræ	6.5	3.22	14.0	20 4.8	19 20.0	- 1 43.4	+1.0684	0.5473	0.1474	+70	+24
17 G. Libræ	6.4	3.21	13.4	20 49.7	11 0 40.5	+ 3 17.6	+1.1244	0.5513	0.1383	+69	+30
18 G. Libræ	6.1	+3.21	-13.3	-20 58.9	1 8.8	+ 3 44.9	+1.2220	0.5516	-0.1380	+69	+41
43 B. Libræ	5.7	3.27	14.4	21 2.8	5 43.5	+ 8 10.3	+0.6762	0.5551	0.1239	+67	- 2
47 G. Libræ	6.1	3.21	12.2	21 42.8	9 46.4	-11 55.2	+0.8736	0.5582	0.1225	+68	+11
64 G. Libræ	5.8	3.20	-11.6	22 5.8	14 9.6	- 7 41.2	+0.7602	0.5615	-0.1140	+68	+ 3
NEW MOON.											
253 B. Sagittarii	6.1	+3.30	+ 7.0	-21 29.0	15 22 13.5	- 3 34.5	+1.2372	0.5323	+0.1387	+69	+43
266 B. Sagittarii	6.1	3.25	7.9	19 2.1	16 0 31.8	- 1 21.5	-0.9270	0.5813	0.1437	-24	-90
f Sagittarii	5.1	3.28	8.4	19 57.6	4 37.2	+ 2 34.6	+0.6173	0.5795	0.1522	+65	- 6
57 Sagittarii	6.0	3.29	9.0	19 15.2	7 2.7	+ 4 54.7	+0.2765	0.5784	0.1571	+44	-25
31 B. Capricorni	6.4	+3.31	+12.5	-13 0.8	22 26.6	- 4 15.6	-0.3639	0.5709	+0.1854	+13	-62
27 G. Capricorni	6.2	3.29	12.7	15 19.9	23 27.2	- 3 17.3	-0.8664	0.5704	0.1871	-15	-90
47 B. Capricorni	6.2	3.35	12.7	16 48.5	17 1 20.4	- 1 23.1	+0.9840	0.5695	0.1901	+73	+16
r Capricorni	5.2	3.32	13.4	15 14.6	2 57.7	+ 0 5.6	-0.2894	0.5687	0.1928	+18	-57
61 B. Capricorni	5.9	3.34	13.3	16 25.0	3 29.0	+ 0 36.6	+1.0011	0.5684	0.1935	+74	+18
95 B. Capricorni	5.9	+3.37	+14.8	-14 48.0	11 21.9	+ 8 11.7	+0.9344	0.5644	+0.2049	+75	+13

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1917.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	z'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
γ Aquarii	4.5	+3.35	+16.4	-11 42.2	17 16 9.0	-11 11.2	-1.1988	0.5621	+0.2112	-37	-90
53 B. Aquarii	6.5	3.40	16.2	13 32.5	18 57.0	-8 29.3	+1.2546	0.5608	0.2146	+76	+39
19 Aquarii	5.6	3.38	17.6	10 5.9	23 3.5	-431.3	-1.3336	0.5590	0.2102	-53	-81
72 B. Aquarii	6.5	3.41	17.4	11 55.4	18 0 22.7	-8 14.9	+0.8008	0.5584	0.2206	+78	+4
137 B. Capricorni	6.2	3.44	18.4	10 56.7	5 24.0	+1 35.9	+0.9336	0.5562	0.2256	+79	+12
c^1 Capricorni	5.3	+3.44	+19.2	-9 27.5	7 53.7	+4 0.5	-0.0023	0.5552	+0.2278	+37	-40
c^2 Capricorni	6.3	3.45	19.2	9 39.3	8 27.7	+4 33.3	+0.3244	0.5550	0.2283	+56	-23
30 Aquarii	5.6	3.48	21.0	6 55.1	16 9.6	+11 59.4	-0.6571	0.5521	0.2343	+3	-85
44 Aquarii	5.7	3.52	22.0	5 47.8	22 23.1	-5 54.6	-0.2998	0.5501	0.2381	+23	-57
51 Aquarii	5.8	3.55	22.4	5 15.1	19 1 40.6	-2 49.0	-0.0838	0.5492	0.2397	+35	-45
187 B. Aquarii	6.3	+3.56	+23.4	-3 19.8	4 59.3	+0 23.1	-1.2285	0.5484	+0.2411	-35	-90
κ Aquarii	5.2	3.60	23.1	4 39.0	7 57.1	+3 14.9	+0.8214	0.5477	0.2422	+85	+4
207 B. Aquarii	6.3	3.62	23.5	3 58.8	9 21.3	+4 36.2	+0.4839	0.5474	0.2426	+69	-14
6 G. Piscium	6.2	3.70	24.4	2 50.0	17 25.7	-11 35.4	+1.2919	0.5461	0.2442	+87	+41
κ Piscium	6.3	3.69	25.5	0 15.2	18 32.1	-10 31.2	-1.0475	0.5459	0.2443	-19	-90
κ Piscium	4.9	+3.84	+26.4	+0 48.5	20 6 44.3	+1 16.7	+0.8589	0.5451	+0.2437	+90	+7
9 Piscium	6.4	3.84	26.4	0 40.4	6 53.1	+1 25.1	+1.0310	0.5451	0.2437	+90	+18
16 Piscium	5.7	3.88	26.9	1 38.9	11 8.2	+5 31.9	+1.0780	0.5451	0.2427	+90	+21
19 Piscium	5.4	3.94	27.4	3 2.0	15 46.6	+10 1.0	+0.7973	0.5454	0.2412	+90	+3
ω Piscium	4.0	4.03	28.6	6 24.7	21 45.2	-8 12.3	-1.1955	0.5460	0.2385	-31	-84
36 Piscium	6.2	+4.13	+29.1	+7 47.3	21 5 43.3	-0 30.2	-0.7109	0.5472	+0.2338	+2	-82
d Piscium	5.4	4.16	29.1	7 44.2	7 34.5	+1 17.3	-0.2279	0.5476	0.2325	+28	-51
136 B. Piscium	6.5	4.30	29.0	8 54.6	17 0.6	+10 24.3	+0.7386	0.5499	0.2249	+90	+2
58 Piscium	5.7	4.37	29.9	11 31.8	19 38.8	-11 2.6	-1.3395	0.5506	0.2224	-51	-76
75 Piscium	6.3	4.52	29.5	12 31.2	22 4 28.9	-2 30.8	-0.4260	0.5534	0.2180	-17	-60
η Piscium	3.7	+4.74	+29.3	+14 55.6	15 36.3	+8 13.6	-0.5934	0.5576	+0.1968	+8	-69
101 Piscium	6.2	4.76	28.8	14 14.7	17 30.7	+10 4.0	+0.4798	0.5584	0.1962	+70	-9
105 Piscium	6.1	4.82	29.1	15 59.6	19 13.4	+11 43.1	-0.9757	0.5590	0.1937	-16	-74
4 Arietis	5.8	4.89	28.8	16 33.0	22 57.7	-8 40.4	-0.8338	0.5605	0.1881	-7	-73
ϵ Arietis	5.1	4.97	28.4	17 25.2	23 2 58.2	-4 48.4	-0.9852	0.5622	0.1817	-17	-73
35 B. Arietis	6.4	+5.02	+28.1	+17 51.8	5 44.3	-2 8.1	-0.9425	0.5634	+0.1772	-14	-72
47 B. Arietis	6.5	5.05	27.8	17 38.5	7 30.1	-0 26.1	-0.4068	0.5641	0.1742	+18	-54
20 H ¹ . Arietis	6.4	5.06	27.3	16 50.6	8 12.3	+0 14.5	+0.5358	0.5644	0.1730	+75	-3
26 Arietis	6.2	5.27	26.5	19 29.7	17 20.0	+9 2.6	-0.6861	0.5682	0.1564	+2	-70
μ Arietis	5.7	5.35	25.5	19 39.9	22 20.0	-10 8.2	-0.1043	0.5702	0.1468	+34	-34
47 Arietis	5.8	+5.49	+24.1	+20 20.6	24 4 58.3	-3 44.5	+0.1259	0.5727	+0.1332	+47	-20
ϵ Arietis (<i>mean</i>)	4.6	5.50	24.2	21 0.9	5 26.9	+3 17.0	-0.5053	0.5729	0.1322	+12	-56
ζ Arietis	5.0	5.60	24.2	20 44.6	12 2.2	+3 3.7	+0.6005	0.5752	0.1180	+83	+6
τ Arietis	5.2	5.65	21.8	20 51.3	14 40.6	+5 36.2	+0.7809	0.5760	0.1121	+90	+18
63 Arietis	5.2	5.64	21.6	20 27.1	15 19.1	+6 13.3	+1.2789	0.5762	0.1107	+77	+61
65 Arietis	6.0	+5.65	+21.4	+20 30.9	16 1.0	+6 53.7	+1.2899	0.5764	+0.1091	+73	+64
66 Arietis	6.1	5.75	21.3	22 31.5	17 39.7	+8 28.7	-0.6153	0.5769	0.1054	+5	-61
23 Tauri	4.3	5.90	19.5	23 41.8	25 1 3.6	-8 24.0	-1.1163	0.5787	0.0882	-31	-66
η Tauri	3.0	5.91	19.4	23 51.3	1 32.2	-7 56.4	-1.2396	0.5788	0.0871	-47	-66
104 B. Tauri	5.5	5.89	19.1	23 10.3	1 54.2	-7 35.3	-0.4990	0.5789	0.0862	+12	-52
27 Tauri	3.7	+5.92	+19.1	+23 48.4	2 13.9	-7 16.3	-1.1292	0.5790	+0.0854	-32	-66
28 Tauri	5.2	5.92	19.2	23 53.4	2 14.4	-7 15.8	-1.2152	0.5790	0.0854	-43	-66
133 B. Tauri	5.9	5.86	18.6	21 59.9	2 34.0	-6 56.9	+0.7787	0.5791	0.0846	+90	+20
32 Tauri	5.8	5.91	17.8	22 14.7	5 25.8	+4 11.7	+0.7549	0.5796	0.0777	+90	+19
33 Tauri	6.0	5.93	18.0	22 56.4	5 30.3	+4 7.2	+0.0369	0.5796	0.0776	+42	-20
161 B. Tauri	6.5	+5.96	+17.5	+22 58.4	7 6.4	-2 34.8	+0.1246	0.5799	+0.0737	+47	-15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels.
Name.	Mag.	Red'ns from 1917.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Υ	α'	γ'	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				N. S
36 Tauri	5.6	+6.01	+17.2	+23 53.0	25 8 30.0	-1 14.4	-0.7230	0.5801	+0.0703	-2-66
192 B. Tauri	6.1	5.98	15.8	22 12.3	12 1.1	+2 8.8	+1.2578	0.5806	0.0617	+79+62
62 Tauri	6.1	6.12	14.6	24 6.8	16 34.5	+6 31.8	-0.4761	0.5809	0.0505	+13-47
v Tauri	4.2	6.07	14.0	22 37.8	17 32.5	+7 27.6	+1.1198	0.5810	0.0480	+90+47
72 Tauri	5.4	6.07	14.0	22 48.9	17 56.8	+7 51.1	-0.9471	0.5810	0.0470	+90+34
284 B. Tauri	6.0	+6.14	+12.7	+23 10.5	21 43.1	+11 28.8	-0.7301	0.5810	+0.0376	+90+22
r Tauri	4.3	6.13	11.9	22 48.1	0 5.7	-10 14.0	+1.2041	0.5810	0.0317	+89+57
95 Tauri	6.2	6.19	11.9	23 56.2	0 29.0	-9 51.6	+0.0292	0.5810	0.0307	+42-16
300 B. Tauri	6.2	6.18	11.5	23 28.8	1 30.5	-8 52.4	+0.5368	0.5810	0.0281	+78+11
315 B. Tauri	6.3	6.26	10.1	24 27.8	5 50.4	-4 42.3	-0.3956	0.5806	0.0172	+18-39
99 Tauri	6.0	+6.24	+9.8	+23 49.4	6 29.2	-4 5.0	+0.2873	0.5805	+0.0156	+58-1
k Tauri	5.6	6.29	9.8	24 55.6	6 36.7	-3 57.8	-0.8686	0.5805	0.0153	-12-65
103 Tauri	5.5	6.28	8.3	24 9.5	10 43.9	+0 0.1	-0.0218	0.5800	+0.0050	+39-16
118 Tauri	5.4	6.38	5.2	25 5.1	19 29.3	+8 25.9	-1.0515	0.5781	-0.0168	-26-65
121 Tauri	5.1	6.34	4.2	23 59.2	22 4.7	+10 55.5	+0.0557	0.5774	0.0232	+43-13
394 B. Tauri	6.0	+6.32	+3.0	+23 10.0	27 1 23.0	-9 53.6	+0.8322	0.5763	-0.0312	+90+28
132 Tauri	5.0	6.39	2.2	24 32.5	3 44.9	-7 36.9	-0.7018	0.5755	0.0370	0-64
412 B. Tauri	5.8	6.39	+1.0	24 14.3	7 5.3	-4 24.0	-0.5192	0.5742	0.0450	+10-50
1 Geminorum	4.3	6.35	-0.2	23 16.1	10 8.5	-1 27.4	+0.3603	0.5730	0.0521	+63-0
3 Geminorum	5.6	6.34	1.0	23 7.7	12 31.7	+0 50.6	+0.3791	0.5719	0.0577	+64 0
5 Geminorum	5.9	+6.41	-1.3	+24 26.4	13 16.6	+1 33.7	-1.0567	0.5716	-0.0594	-26-66
6 Geminorum	6.3	6.34	1.4	22 55.7	13 38.0	+1 54.4	+0.5264	0.5714	0.0603	+76+8
7 Gemin. (var.)	3.2	6.31	1.8	22 31.9	14 44.0	+2 53.0	-0.8800	0.5709	0.0628	+90+28
8 Geminorum	6.1	6.39	2.0	23 59.8	15 19.4	+3 32.1	-0.7145	0.5706	0.0641	-1-66
9 Geminorum	6.2	6.38	2.1	23 46.2	15 36.5	+3 48.7	-0.4910	0.5705	0.0648	+12-49
μ Geminorum	3.2	+6.33	-3.1	+22 33.4	18 11.4	+6 18.0	+0.6238	0.5692	-0.0706	+87+12
36 B. Geminorum	6.0	6.36	3.4	23 22.4	19 17.6	+7 21.8	-0.3245	0.5687	0.0731	+22-39
d Geminorum	5.2	6.27	7.3	21 51.5	6 38.2	-5 41.9	+0.3227	0.5624	0.0975	+61-7
ζ Gemin. (var.)	3.7	6.21	9.1	20 41.4	12 13.1	-0 18.7	+0.9978	0.5590	0.1087	+90+32
44 Geminorum	5.9	6.30	9.4	22 45.6	12 43.2	+0 10.4	-1.2742	0.5586	0.1097	-53-67
120 B. Geminorum	6.5	+6.22	-10.4	+21 23.4	14 54.0	+2 16.7	-0.0498	0.5573	-0.1140	+37-28
56 Geminorum	5.2	6.17	11.7	20 35.9	20 14.8	+7 26.5	+0.1639	0.5538	0.1240	+50-18
149 B. Geminorum	6.4	6.19	12.4	21 41.9	22 28.1	+9 35.3	-1.3002	0.5523	0.1280	-59-67
61 Geminorum	5.8	6.15	12.4	20 25.3	22 31.2	+9 38.2	+0.0680	0.5523	0.1281	+44-23
63 Geminorum	5.3	6.20	12.6	21 36.8	22 52.2	+9 58.6	-1.2590	0.5521	0.1287	-47-68
79 Geminorum	6.3	+6.11	-14.9	+20 30.7	29 6 55.2	-6 14.6	-1.1699	0.5466	-0.1426	-34-69
g Geminorum	5.0	6.03	14.9	18 42.6	7 24.2	-5 46.6	+0.7067	0.5463	0.1433	+90+9
209 B. Geminorum	6.2	6.05	15.7	19 32.1	10 6.8	-3 9.2	-0.5786	0.5444	0.1477	+8-63
3 Cancr	5.7	5.95	16.6	17 31.9	14 19.0	+0 54.7	+0.9518	0.5416	0.1542	+90+23
10 H. Cancr	6.1	5.99	17.4	19 4.4	16 10.8	+2 43.0	-1.0057	0.5404	0.1570	-19-71
ζ Cancr (mean)	4.7	+5.93	-18.3	+17 53.6	19 45.9	+6 11.0	-0.3014	0.5379	-0.1621	+23-48
d ² Cancr	6.2	5.84	19.9	17 18.9	30 2 23.3	-11 24.1	-0.7783	0.5334	0.1711	-3-73
90 B. Cancr	6.3	5.75	20.7	15 35.7	7 28.0	-6 29.0	+0.2069	0.5301	0.1774	+52-22
54 Cancr	6.3	5.68	22.3	15 39.2	14 54.4	+0 43.7	-1.2088	0.5254	0.1858	-35-74
209 B. Cancr	6.5	5.50	23.7	11 53.8	31 0 29.3	+10 1.4	+1.0708	0.5197	0.1953	+90+26
222 B. Cancr	6.3	+5.47	-24.4	+11 50.6	4 39.8	-9 55.5	+0.3076	0.5174	-0.1989	+58-20
ξ Leonis	5.1	5.39	25.7	11 39.7	12 1.5	-2 46.7	-0.9796	0.5135	0.2047	-15-78
h Leonis	5.2	5.36	25.3	10 4.5	12 2.7	-2 45.5	+0.7579	0.5135	0.2047	+90+4
o Leonis	3.8	+5.31	-26.1	+10 15.8	16 54.3	+1 57.7	-0.4515	0.5111	-0.2080	+16-64

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
			h m	h m	°	°	h m	h m	°	°	h m
Jan. 3	66 Arietis	6.1	23 7	4 16	108	165	0 6	5 14	207	260	0 59
3	23 Tauri	4.3	10 0	15 6	12	320	10 13	15 20	945	294	0 13
6	5 Geminorum	5.9	23 48	4 44	152	204	0 13	5 9	202	256	0 25
7	44 Geminorum	5.9	0 29	5 21	125	177	1 19	6 12	240	295	0 50
7	δ Geminorum	3.5	9 48	14 39	106	51	11 2	15 53	302	244	1 14
7	149 B. Geminorum	6.4	13 43	18 33	45	353	14 6	18 56	354	304	0 23
7	63 Geminorum	5.3	14 4	18 55	52	1	14 33	19 23	346	298	0 28
8	85 Geminorum	5.2	0 43	5 32	91	140	1 41	6 29	285	338	0 57
8	217 B. Geminorum	6.3	3 23	8 11	57	113	4 16	9 3	328	24	0 52
9	54 Cancrī	6.3	5 37	10 21	169	220	6 23	11 6	236	283	0 45
10	ε Leonis	5.1	2 57	7 38	165	216	3 29	8 10	231	283	0 32
11	155 B. Leonis	6.5	7 24	11 59	141	185	8 43	13 18	286	317	1 19
14	γ Virginis	5.3	6 31	10 55	88	140	7 23	11 47	330	19	0 52
18	85 B. Scorpii	6.0	11 8	15 16	71	120	11 58	16 5	322	6	0 50
26	19 Piscium	5.4	2 48	6 25	70	26	3 52	7 30	229	180	1 5
29	26 Arietis	6.2	7 12	10 37	55	359	8 11	11 35	283	229	0 58
30	66 Arietis	6.1	9 18	12 39	124	70	10 4	13 24	229	178	0 45
Feb. 2	5 Geminorum	5.9	10 16	13 24	158	99	10 58	14 6	234	176	0 42
3	87 B. Geminorum	5.8	2 7	5 13	60	118	3 9	6 15	305	4	1 2
3	44 Geminorum	5.9	11 0	14 4	104	45	12 5	15 9	298	242	1 5
4	85 Geminorum	5.2	11 28	14 28	52	356	11 57	14 58	1	306	0 29
6	ε Leonis	5.1	13 31	16 23	57	4	14 0	16 52	4	311	0 29
14	3 Scorpii	5.9	13 42	16 3	136	162	14 54	17 14	260	273	1 11
25	47 B. Arietis	6.5	6 59	8 37	46	351	7 52	9 30	286	233	0 53
26	ε Arietis (mean)	4.6	4 51	6 26	106	56	6 1	7 36	228	172	1 10
27	36 Tauri	5.6	9 58	11 28	88	34	10 54	12 24	273	228	0 56
28	ι Tauri	5.6	9 26	10 52	118	60	10 26	11 52	256	200	1 0
Mar. 6	83 B. Leonis	5.9	9 17	10 20	80	93	10 17	11 20	354	344	1 0
6	89 B. Leonis	6.2	11 9	12 11	141	114	12 28	13 31	292	249	1 20
6	π Leonis	4.9	12 42	13 44	119	74	13 55	14 57	307	256	1 13
10	370 B. Virginis	6.0	8 45	9 32	111	156	9 54	10 41	315	352	1 9
12	9 G. Libræ	6.5	9 36	10 16	103	152	10 39	11 18	309	352	1 2
25	μ Arietis	5.7	9 31	9 19	80	31	10 22	10 10	263	218	0 51
28	118 Tauri	5.4	8 36	8 13	54	354	9 26	9 3	327	268	0 50
31	10 H. Cancrī	6.1	7 53	7 18	136	140	9 19	8 44	278	240	1 26
Apr. 1	54 Cancrī	6.3	6 38	5 59	100	146	8 4	7 25	315	335	1 26
2	ο Leonis	3.8	11 10	10 27	164	132	12 15	11 31	267	222	1 4
3	155 B. Leonis	6.5	8 29	7 42	113	147	9 54	9 6	319	328	1 24
10	σ Scorpii	3.1	16 9	14 53	116	117	17 31	16 15	260	244	1 22
12	70 B. Sagittarii	6.4	16 2	14 38	22	49	16 36	15 13	331	352	0 35
14	σ Capricorni	5.5	15 36	14 4	113	161	16 29	14 58	218	260	0 53
27	209 B. Geminorum	6.2	12 42	10 20	80	25	13 33	11 11	326	272	0 51
May 7	31 B. Scorpii	5.4	12 33	9 32	119	157	13 45	10 43	277	303	1 11
7	40 B. Scorpii	5.4	15 14	12 12	113	122	16 38	13 36	272	262	1 23
7	50 B. Scorpii	6.4	18 36	15 33	45	14	19 26	16 24	319	280	0 51
10	191 B. Sagittarii	6.5	18 47	15 32	90	94	20 4	16 49	233	220	1 17
30	64 B. Virginis	6.5	17 38	13 5	136	86	18 33	14 0	267	215	0 55
June 3	42 Libræ	5.0	20 7	15 18	13	327	20 19	15 30	352	305	0 12

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
 † Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
			h m	h m	°	°	h m	h m	°	°	h m
June 11	22 B. Piscium	6.4	17 28	12 8	103	154	18 13	12 53	204	255	0 45
11	9 Piscium	6.4	19 41	14 21	35	81	20 44	15 23	261	300	1 3
11	κ Piscium	4.9	20 5	14 45	341	25	20 20	15 0	316	358	0 15
15	47 Arietis	5.8	20 10	14 34	51	101	21 0	15 24	270	324	0 50
25	p ³ Leonis	6.1	14 20	8 6	120	76	15 32	9 18	301	252	1 12
26	13 B. Virginis	† 5.9	17 2	10 43	56	6	17 36	11 17	351	300	0 33
July 1	50 B. Scorpii	6.4	15 56	9 18	26	27	16 20	9 41	354	350	0 23
3	70 B. Sagittarii	6.4	22 13	15 26	154	112	22 24	15 36	173	129	0 10
4	222 B. Sagittarii	5.5	19 38	12 48	80	75	20 53	14 2	238	217	1 15
4	50 Sagittarii	5.5	22 47	15 56	66	27	23 49	16 57	249	202	1 1
27	18 G. Libræ	† 6.1	19 16	10 55	59	13	20 7	11 46	317	266	0 50
Aug. 5	16 Piscium	5.7	17 43	8 47	26	77	18 27	9 30	282	333	0 43
5	19 Piscium	5.4	23 16	14 19	53	62	0 32	15 34	236	219	1 15
6	136 B. Piscium	6.5	23 32	14 30	95	119	0 31	15 30	196	199	1 0
7	101 Piscium	6.2	23 35	14 30	94	136	0 38	15 33	203	227	1 3
10	62 Tauri	6.1	0 30	15 13	19	78	1 9	15 52	311	9	0 39
12	8 Geminorum	6.1	1 26	16 1	27	84	1 59	16 34	329	28	0 33
12	9 Geminorum	6.2	1 26	16 2	91	149	2 38	17 13	266	325	1 11
28	222 B. Sagittarii	5.5	20 18	9 51	116	102	21 8	10 41	200	176	0 50
28	50 Sagittarii	† 5.5	23 18	12 51	99	56	0 9	13 42	217	169	0 51
30	72 B. Aquarii	6.5	1 37	15 2	342	297	1 50	15 14	319	272	0 12
Sept. 1	κ Piscium	4.9	4 2	17 18	98	48	4 49	18 5	210	159	0 47
4	20 H ¹ . Arietis	6.4	0 28	13 32	109	149	1 21	14 26	195	216	0 53
6	33 Tauri	6.0	21 26	10 24	6	58	21 46	10 43	323	17	0 19
6	161 B. Tauri	6.5	22 41	11 38	68	124	23 43	12 40	258	317	1 2
7	99 Tauri	6.0	22 54	11 47	148	202	23 16	12 9	191	247	0 22
23	63 Ophiuchi	6.1	19 47	7 38	54	30	20 57	8 48	282	246	1 10
24	154 B. Sagittarii	5.9	20 38	8 24	87	64	21 48	9 35	238	199	1 11
26	95 B. Capricorni	5.9	0 20	11 58	42	2	1 19	12 57	260	214	0 59
29	16 Piscium	5.7	18 46	6 13	356	46	19 9	6 37	309	358	0 23
29	19 Piscium	5.4	0 17	11 44	44	33	1 29	12 56	247	216	1 12
Oct. 30	136 B. Piscium	6.5	23 22	10 44	42	68	0 33	11 56	251	253	1 12
4	95 Tauri	6.2	3 30	14 36	85	126	4 57	16 3	262	248	1 27
5	121 Tauri	5.1	0 27	11 30	72	129	1 31	12 34	275	334	1 5
7	56 Geminorum	† 5.2	0 0	10 55	122	170	0 49	11 44	247	299	0 49
7	61 Geminorum	5.8	2 27	13 22	142	198	3 16	14 11	232	288	0 49
21	24 Sagittarii	5.7	18 52	4 53	141	136	19 26	5 27	190	177	0 35
21	117 B. Sagittarii	5.8	21 25	7 26	83	50	22 32	8 33	240	197	1 7
23	47 B. Capricorni	6.2	23 5	8 57	87	55	0 5	9 57	216	175	1 0
24	72 B. Aquarii	6.5	22 0	7 49	16	7	22 58	8 47	279	256	0 58
26	κ Piscium	4.9	4 27	14 7	149	99	4 32	14 12	160	109	0 5
Nov. 29	20 H ¹ . Arietis	6.4	0 47	10 15	64	98	2 4	11 33	243	243	1 17
2	1 Geminorum	4.3	23 36	8 49	81	133	0 34	9 46	273	329	0 57
2	3 Geminorum	5.6	2 19	11 32	130	188	3 17	12 29	229	286	0 57
3	120 B. Geminorum	6.5	5 27	14 35	69	115	6 41	15 49	320	336	1 13
10	γ Virginis	† 5.3	6 54	15 35	110	162	7 57	16 37	305	353	1 2
24	136 B. Piscium	6.5	20 45	4 32	32	82	21 43	5 30	267	313	0 58
27	32 Tauri	5.8	9 56	17 29	144	91	10 28	18 0	216	164	0 32

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.
† Immersion below the horizon of Washington. ‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
Nov. 28	284 B. Tauri	6.0	h m 23 8	h m 6 38	° 114	° 170	h m 23 56	h m 7 27	° 221	° 278	h m 0 48
28	300 B. Tauri	6.2	4 15	11 45	154	172	4 47	12 17	197	193	0 31
30	d Geminorum	5.2	9 56	17 17	66	10	10 46	18 8	333	276	0 50
Dec. 1	g Geminorum	5.0	10 56	18 13	135	81	12 1	19 18	274	218	1 5
3	222 B. Cancri	6.3	6 22	13 32	120	168	7 47	14 57	294	327	1 25
5	237 B. Leonis	6.3	11 23	18 24	162	151	12 35	19 36	271	241	1 11
6	e Leonis	5.1	7 9	14 7	182	230	7 41	14 39	237	283	0 32
22	101 Piscium	6.2	7 23	13 18	103	51	8 12	14 7	228	178	0 49
24	ζ Arietis	5.0	23 30	5 18	87	144	0 36	6 25	230	283	1 7
27	3 Geminorum	5.6	23 58	5 34	69	122	0 54	6 30	286	343	0 56
27	6 Geminorum	6.3	1 9	6 45	120	177	2 6	7 42	237	295	0 57
27	μ Geminorum	3.2	8 3	13 39	178	130	8 27	14 3	212	160	0 24

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
Jan. 1	+ 1.99	-3.16	162.77	July 5	- 0.88	+3.42	240.96
6	- 0.44	3.73	96.92	10	+ 1.39	3.94	174.79
11	2.86	4.27	31.07	15	3.64	4.43	108.62
16	5.23	4.77	325.24	20	5.85	4.90	42.47
21	7.54	5.24	259.40	25	8.00	5.32	338.32
26	- 9.76	-5.66	193.57	30	+10.07	+5.72	270.18
31	11.89	6.04	127.74	Aug. 4	12.06	6.07	204.06
Feb. 5	13.90	6.37	61.90	9	13.96	6.38	137.94
10	15.79	6.65	356.07	14	15.75	6.64	71.84
15	17.54	6.88	290.23	19	17.42	6.86	5.76
20	-19.15	-7.05	224.39	24	+18.98	+7.04	299.69
25	20.62	7.17	158.54	29	20.40	7.16	233.63
Mar. 2	21.93	7.24	92.67	Sept. 3	21.69	7.23	167.58
7	23.08	7.25	26.80	8	22.84	7.25	101.55
12	24.07	7.20	320.91	13	23.84	7.22	35.53
17	-24.89	-7.10	255.00	18	+24.68	+7.13	329.53
22	25.54	6.94	189.08	23	25.37	6.99	263.53
27	26.01	6.74	123.15	28	25.89	6.80	197.55
Apr. 1	26.31	6.48	57.19	Oct. 3	26.24	6.56	131.57
6	26.43	6.18	351.21	8	26.41	6.27	65.60
11	-26.36	-5.83	285.21	13	+26.40	+5.94	359.64
16	26.11	5.44	219.19	18	26.20	5.55	293.69
21	25.68	5.01	153.16	23	25.81	5.13	227.75
26	25.06	4.55	87.10	28	25.23	4.66	161.81
May 1	24.26	4.06	21.02	Nov. 2	24.45	4.16	95.88
6	-23.28	-3.53	314.93	7	+23.47	+3.63	29.95
11	22.13	2.99	248.81	12	22.29	3.07	324.04
16	20.80	2.42	182.69	17	20.93	2.48	258.12
21	19.31	1.84	116.55	22	19.38	1.87	192.22
26	17.67	1.25	50.39	27	17.65	1.25	126.32
31	-15.88	-0.65	344.23	Dec. 2	+15.76	+0.61	60.42
June 5	13.98	-0.05	278.06	7	13.73	-0.03	354.53
10	11.96	+0.55	211.88	12	11.56	0.67	288.65
15	9.85	1.15	145.69	17	9.30	1.29	222.78
20	7.66	1.74	79.51	22	6.95	1.93	156.92
25	- 5.43	+2.32	13.33	27	+ 4.55	-2.54	91.05
30	- 3.16	+2.88	307.14	32	+ 2.11	-3.13	25.20

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on January 1, 1854, Greenwich Mean Noon.

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Date.	Mean Equator.			Orbit.		Mean Longitude. C	Mean Solar Days.	Motion in Mean Longitude.
	<i>i</i>	<i>Δ</i>	<i>Ω'</i>	<i>Γ'</i>	<i>Ω</i>			
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "		° ' "
Jan. 0	22 57.5	107 0.1	3 41.4	306 2.1	290 23.4	2 41.7	0.1	1 19.06
10	22 58.3	106 27.8	3 42.1	307 8.9	289 51.6	134 27.5	0.2	2 38.12
20	22 59.1	105 55.4	3 42.7	308 15.7	289 19.8	266 13.4	0.3	3 57.18
30	22 59.9	105 23.2	3 43.3	309 22.6	288 48.0	37 59.2	0.4	5 16.23
Feb. 9	23 0.7	104 50.9	3 43.8	310 29.4	288 16.3	169 45.1	0.5	6 35.29
							0.6	7 54.35
19	23 1.6	104 18.6	3 44.4	311 36.3	287 44.5	301 30.9	0.7	9 13.41
Mar. 1	23 2.4	103 46.4	3 44.9	312 43.1	287 12.7	73 16.7	0.8	10 32.47
11	23 3.2	103 14.1	3 45.4	313 50.0	286 40.9	205 2.6	0.9	11 51.53
21	23 4.0	102 41.9	3 45.9	314 56.8	286 9.2	336 48.4	1.0	13 10.58
31	23 4.9	102 9.7	3 46.4	316 3.6	285 37.4	108 34.2	2.0	26 21.17
							3.0	39 31.75
Apr. 10	23 5.7	101 37.5	3 46.8	317 10.5	285 5.6	240 20.1	4.0	52 42.33
20	23 6.5	101 5.4	3 47.2	318 17.3	284 33.9	12 5.9	5.0	65 52.92
30	23 7.4	100 33.2	3 47.7	319 24.2	284 2.1	143 51.8	6.0	79 3.50
May 10	23 8.2	100 1.1	3 48.0	320 31.0	283 30.3	275 37.6	7.0	92 14.09
20	23 9.0	99 29.0	3 48.4	321 37.9	282 58.5	47 23.4	8.0	105 24.67
							9.0	118 35.25
30	23 9.9	98 56.9	3 48.8	322 44.7	282 26.8	179 9.3	10.0	131 45.84
June 9	23 10.7	98 24.9	3 49.1	323 51.5	281 55.0	310 55.1		
19	23 11.6	97 52.8	3 49.4	324 58.4	281 23.2	82 41.0	Hours.	° ' "
29	23 12.4	97 20.8	3 49.7	326 5.2	280 51.5	214 26.8	1	0 32.94
July 9	23 13.3	96 48.8	3 49.9	327 12.1	280 19.7	346 12.6	2	1 5.88
							3	1 38.82
19	23 14.1	96 16.8	3 50.2	328 18.9	279 47.9	117 58.5	4	2 11.76
29	23 15.0	95 44.9	3 50.4	329 25.7	279 16.1	249 44.8	5	2 44.70
Aug. 8	23 15.8	95 12.9	3 50.6	330 32.6	278 44.4	21 30.1	6	3 17.65
18	23 16.6	94 41.0	3 50.8	331 39.4	278 12.6	153 18.0	7	3 50.59
28	23 17.5	94 9.1	3 51.0	332 46.3	277 40.8	285 1.8	8	4 23.53
							9	4 56.47
Sept. 7	23 18.4	93 37.2	3 51.1	333 53.1	277 9.0	56 47.7	10	5 29.41
17	23 19.2	93 5.3	3 51.2	335 0.0	276 37.3	188 33.5	11	6 2.35
27	23 20.0	92 33.4	3 51.4	336 6.8	276 5.5	320 19.3	12	6 35.29
Oct. 7	23 20.9	92 1.6	3 51.4	337 13.6	275 33.7	92 5.2	13	7 8.23
17	23 21.8	91 29.8	3 51.5	338 20.5	275 2.0	223 51.0	14	7 41.17
							15	8 14.11
27	23 22.6	90 57.9	3 51.6	339 27.3	274 30.2	355 36.8	16	8 47.06
Nov. 6	23 23.4	90 26.2	3 51.6	340 34.2	273 58.4	127 22.7	17	9 20.00
16	23 24.3	89 54.4	3 51.6	341 41.0	273 26.6	259 8.5	18	9 52.94
26	23 25.2	89 22.6	3 51.6	342 47.9	272 54.9	30 54.4	19	10 25.88
Dec. 6	23 26.0	88 50.9	3 51.5	343 54.7	272 23.1	162 40.2	20	10 58.82
							21	11 31.76
16	23 26.9	88 19.2	3 51.5	345 1.5	271 51.3	294 26.0	22	12 4.70
26	23 27.7	87 47.5	3 51.4	346 8.4	271 19.5	66 11.9	23	12 37.64
36	23 28.6	87 15.9	3 51.3	347 15.2	270 47.8	197 57.7		

Daily motion of Γ' +6'.684Daily motion of Ω -3'.177

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C	
	Long.	Lat.	Long.	Lat.	Colong.	Lat.		
Jan.	1	+6.98	-6.72	0.00	+0.01	11.56	-0.24	338.58
	2	6.75	6.30	0.00	0.01	23.70	0.22	341.13
	3	6.24	5.59	0.00	0.01	35.84	0.19	344.71
	4	5.50	4.61	0.00	0.01	47.98	0.16	349.13
	5	4.53	3.44	0.00	0.01	60.11	0.13	354.10
	6	+3.41	-2.13	0.00	+0.01	72.24	-0.10	359.28
	7	2.16	-0.73	0.00	0.01	84.38	0.07	4.34
	8	+0.82	+0.69	0.00	0.01	96.50	0.04	9.01
	9	-0.57	2.07	0.00	0.01	108.64	-0.01	13.14
	10	1.98	3.36	-0.01	0.01	120.77	+0.02	16.61
	11	-3.34	+4.51	-0.01	+0.01	132.90	+0.05	19.39
	12	4.62	5.48	0.01	0.01	145.04	0.08	21.44
	13	5.76	6.21	0.01	0.01	157.18	0.10	22.71
	14	6.68	6.68	0.01	0.01	169.33	0.13	23.12
	15	7.34	6.84	0.01	0.01	181.48	0.15	22.57
	16	-7.67	+6.68	-0.01	+0.01	193.64	+0.18	20.91
	17	7.62	6.16	0.01	0.01	205.81	0.20	18.02
	18	7.14	5.29	0.01	0.01	217.99	0.23	13.83
	19	6.23	4.07	0.01	0.01	230.17	0.25	8.48
	20	4.91	2.56	0.01	0.01	242.36	0.28	2.35
	21	-3.23	+0.84	-0.01	+0.01	254.55	+0.31	356.01
	22	-1.31	-0.96	0.01	0.01	266.74	0.34	350.08
	23	+0.72	2.70	0.01	0.01	278.93	0.36	345.08
	24	2.70	4.25	0.01	0.01	291.12	0.39	341.12
	25	4.48	5.48	0.01	0.01	303.32	0.42	338.45
	26	+5.93	-6.31	-0.01	+0.01	315.50	+0.46	337.05
	27	6.97	6.74	0.01	0.01	327.68	0.48	336.92
	28	7.55	6.76	0.01	0.01	339.85	0.51	338.03
	29	7.68	6.40	0.01	0.01	352.02	0.54	340.34
	30	7.40	5.74	0.01	0.01	4.18	0.57	343.72
	31	+6.76	-4.81	-0.01	+0.01	16.33	+0.60	347.98
Feb.	1	5.83	3.68	0.01	0.01	28.48	0.63	352.85
	2	4.68	2.40	0.01	0.01	40.63	0.66	357.99
	3	3.38	-1.04	0.01	0.01	52.77	0.69	3.08
	4	2.01	+0.37	0.01	0.02	64.91	0.72	7.86
	5	+0.60	+1.75	-0.01	+0.02	77.05	+0.75	12.14
	6	-0.80	3.05	0.01	0.02	89.18	0.77	15.80
	7	2.14	4.23	0.01	0.02	101.32	0.80	18.77
	8	3.40	5.23	0.02	0.02	113.46	0.82	21.02
	9	4.55	6.01	0.02	0.02	125.59	0.84	22.50
	10	-5.55	+6.52	-0.02	+0.02	137.73	+0.86	23.14
	11	6.37	6.74	0.02	0.02	149.88	0.88	22.84
	12	6.98	6.65	0.02	0.02	162.03	0.90	21.51
	13	7.33	6.23	0.02	0.02	174.19	0.92	19.03
	14	7.38	5.48	0.02	0.02	186.36	0.93	15.35
	15	-7.10	+4.41	-0.02	+0.02	198.53	+0.95	10.54
	16	-6.44	+3.06	-0.02	+0.02	210.71	+0.97	4.84

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Feb. 16	-6.44	+3.06	-0.02	+0.02	210.71	+0.97	4.84
17	5.40	+1.49	0.02	0.02	222.89	0.98	358.71
18	3.98	-0.22	0.02	0.02	235.08	1.00	352.69
19	2.24	1.95	0.02	0.02	247.28	1.02	347.28
20	-0.30	3.56	0.01	0.02	259.48	1.04	342.82
21	+1.71	-4.92	-0.01	+0.02	271.68	+1.07	339.52
22	3.62	5.92	0.01	0.02	283.89	1.09	337.49
23	5.25	6.50	0.01	0.02	296.09	1.11	336.79
24	6.50	6.66	0.01	0.02	308.29	1.13	337.43
25	7.26	6.40	0.01	0.02	320.48	1.16	339.37
26	+7.52	-5.80	-0.01	+0.02	332.67	+1.18	342.51
27	7.30	4.92	0.01	0.02	344.85	1.20	346.63
28	6.67	3.82	0.01	0.02	357.02	1.23	351.44
Mar. 1	5.71	2.57	0.01	0.02	9.20	1.25	356.60
2	4.51	-1.23	0.01	0.02	21.36	1.27	1.76
3	+3.15	+0.15	-0.02	+0.02	33.52	+1.29	6.64
4	1.73	1.51	0.02	0.02	45.68	1.31	11.07
5	+0.30	2.81	0.02	0.02	57.83	1.33	14.90
6	-1.05	3.98	0.02	0.02	69.98	1.35	18.08
7	2.29	5.00	0.02	0.02	82.13	1.36	20.54
8	-3.39	+5.79	-0.02	+0.02	94.28	+1.38	22.24
9	4.33	6.34	0.02	0.02	106.42	1.39	23.10
10	5.10	6.59	0.02	0.02	118.57	1.40	23.03
11	5.69	6.54	0.02	0.02	130.73	1.40	21.94
12	6.10	6.16	0.02	0.02	142.88	1.40	19.72
13	-6.31	+5.46	-0.02	+0.02	155.05	+1.41	16.34
14	6.31	4.47	0.02	0.02	167.22	1.41	11.86
15	6.07	3.21	0.02	0.02	179.39	1.42	6.49
16	5.57	1.74	0.02	0.02	191.57	1.42	0.62
17	4.76	+0.14	0.02	0.02	203.76	1.42	354.71
18	-3.65	-1.50	-0.02	+0.02	215.96	+1.43	349.22
19	2.26	3.08	0.02	0.02	228.16	1.43	344.50
20	-0.64	4.46	0.02	0.02	240.37	1.44	340.78
21	+1.10	5.54	0.02	0.02	252.58	1.45	338.21
22	2.81	6.25	0.02	0.02	264.80	1.46	336.91
23	+4.35	-6.53	-0.02	+0.02	277.02	+1.47	336.95
24	5.56	6.39	0.02	0.02	289.24	1.48	338.36
25	6.36	5.87	0.02	0.02	301.45	1.49	341.09
26	6.67	5.03	0.02	0.02	313.66	1.50	344.96
27	6.52	3.95	0.02	0.02	325.86	1.51	349.68
28	+5.95	-2.70	-0.02	+0.02	338.07	+1.52	354.87
29	5.02	-1.35	0.02	0.02	350.26	1.53	0.15
30	3.84	+0.03	0.02	0.02	2.45	1.54	5.21
31	2.50	1.38	0.02	0.02	14.63	1.55	9.82
Apr. 1	+1.09	2.67	0.02	0.02	26.81	1.56	13.85
2	-0.29	+3.84	-0.02	+0.02	38.99	+1.57	17.23
3	-1.58	+4.86	-0.02	+0.02	51.16	+1.57	19.92

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Apr. 1	+1.09	+2.67	−0.02	+0.02	26.81	+1.56	13.85
2	−0.29	3.84	0.02	0.02	38.99	1.57	17.23
3	1.58	4.86	0.02	0.02	51.16	1.57	19.92
4	2.71	5.68	0.02	0.02	63.33	1.58	21.86
5	3.64	6.24	0.02	0.02	75.50	1.58	22.98
6	−4.35	+6.53	−0.02	+0.02	87.66	+1.57	23.19
7	4.84	6.50	0.03	0.02	99.82	1.57	22.37
8	5.12	6.14	0.03	0.02	111.99	1.56	20.42
9	5.20	5.46	0.03	0.02	124.15	1.55	17.27
10	5.12	4.48	0.03	0.02	136.32	1.54	12.98
11	−4.88	+3.24	−0.02	+0.02	148.50	+1.53	7.76
12	4.48	1.80	0.02	0.02	160.68	1.51	1.99
13	3.91	+0.23	0.02	0.02	172.86	1.50	356.12
14	3.17	−1.36	0.02	0.02	185.06	1.49	350.60
15	2.24	2.90	0.02	0.02	197.26	1.48	345.76
16	−1.13	−4.26	−0.02	+0.02	209.47	+1.47	341.83
17	+0.13	5.37	0.02	0.02	221.69	1.46	338.94
18	1.46	6.14	0.02	0.02	233.91	1.45	337.21
19	2.77	6.50	0.02	0.02	246.14	1.45	336.73
20	3.94	6.46	0.02	0.02	258.37	1.44	337.58
21	+4.87	−6.02	−0.02	+0.02	270.60	+1.44	339.79
22	5.46	5.24	0.02	0.02	282.84	1.44	343.25
23	5.66	4.18	0.02	0.02	295.07	1.43	347.73
24	5.45	2.93	0.02	0.02	307.30	1.43	352.87
25	4.86	1.57	0.02	0.02	319.52	1.43	358.25
26	+3.95	−0.16	−0.02	+0.02	331.74	+1.42	349
27	2.80	+1.23	0.02	0.02	343.95	1.42	8.33
28	1.50	2.55	0.02	0.02	356.16	1.42	12.60
29	+0.13	3.76	0.02	0.02	8.37	1.42	16.22
30	−1.21	4.80	0.02	0.02	20.56	1.41	19.14
May 1	−2.44	+5.65	−0.02	+0.02	32.76	+1.40	21.34
2	3.48	6.25	0.02	0.03	44.95	1.40	22.74
3	4.27	6.58	0.02	0.03	57.13	1.39	23.27
4	4.80	6.60	0.02	0.03	69.32	1.37	22.81
5	5.04	6.29	0.02	0.03	81.50	1.36	21.22
6	−5.02	+5.65	−0.02	+0.03	93.67	+1.34	18.40
7	4.75	4.68	0.02	0.03	105.85	1.32	14.36
8	4.28	3.43	0.02	0.03	118.03	1.29	9.26
9	3.66	1.96	0.02	0.02	130.21	1.26	3.47
10	2.92	+0.36	0.02	0.02	142.40	1.24	357.49
11	−2.08	−1.27	−0.02	+0.02	154.59	+1.21	351.80
12	1.18	2.83	0.02	0.02	166.79	1.19	346.78
13	−0.22	4.22	0.02	0.02	179.00	1.16	342.65
14	+0.78	5.35	0.02	0.02	191.21	1.14	339.53
15	1.78	6.16	0.01	0.02	203.44	1.11	337.52
16	+2.75	−6.58	−0.01	+0.02	215.66	+1.09	336.69
17	+3.62	−6.61	−0.01	+0.02	227.90	+1.08	337.12

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C	
	Long.	Lat.	Long.	Lat.	Colong.	Lat.		
May	17	+3.62	-6.61	-0.01	+0.02	227.90	+1.08	337.12
	18	4.34	6.25	0.01	0.02	240.14	1.06	338.84
	19	4.83	5.53	0.01	0.02	252.38	1.04	341.85
	20	5.04	4.52	0.01	0.02	264.62	1.03	345.97
	21	4.95	3.28	0.01	0.02	276.87	1.01	350.91
	22	+4.54	-1.91	-0.01	+0.02	289.12	+1.00	356.27
	23	3.84	-0.46	0.01	0.03	301.36	0.98	1.65
	24	2.87	+0.97	0.01	0.03	313.60	0.97	6.70
	25	1.71	2.35	0.01	0.03	325.83	0.96	11.22
	26	+0.41	3.61	0.02	0.03	338.06	0.95	15.09
	27	-0.93	+4.70	-0.02	+0.03	350.29	+0.93	18.26
	28	2.24	5.61	0.02	0.03	2.51	0.92	20.71
	29	3.44	6.27	0.02	0.03	14.72	0.90	22.39
	30	4.44	6.67	0.02	0.03	26.93	0.89	23.24
	31	5.18	6.77	0.02	0.03	39.14	0.87	23.15
June	1	-5.62	+6.54	-0.02	+0.03	51.33	+0.85	21.99
	2	5.72	5.98	0.02	0.03	63.53	0.82	19.64
	3	5.48	5.08	0.02	0.03	75.72	0.80	16.02
	4	4.93	3.86	0.02	0.03	87.90	0.77	11.20
	5	4.10	2.40	0.02	0.03	100.09	0.74	5.49
	6	-3.07	+0.76	-0.02	+0.03	112.28	+0.70	359.35
	7	1.89	-0.95	0.01	0.03	124.47	0.67	353.39
	8	-0.65	2.59	0.01	0.03	136.67	0.63	348.02
	9	+0.60	4.08	0.01	0.03	148.87	0.60	343.54
	10	1.78	5.29	0.01	0.03	161.08	0.56	340.13
	11	+2.86	-6.16	-0.01	+0.03	173.29	+0.53	337.84
	12	3.79	6.66	0.01	0.03	185.51	0.50	336.73
	13	4.53	6.75	0.01	0.03	197.74	0.47	336.85
	14	5.06	6.46	0.01	0.03	209.97	0.44	338.23
	15	5.36	5.81	0.01	0.03	222.21	0.42	340.86
	16	+5.41	-4.86	-0.01	+0.03	234.46	+0.39	344.63
	17	5.21	3.67	0.01	0.03	246.71	0.37	349.31
	18	4.76	2.31	0.01	0.03	258.96	0.34	354.54
	19	4.08	-0.86	0.01	0.03	271.21	0.32	359.92
	20	3.18	+0.60	0.01	0.03	283.46	0.30	5.11
	21	+2.09	+2.02	-0.01	+0.03	295.71	+0.28	9.83
	22	+0.86	3.33	0.01	0.03	307.96	0.27	13.94
	23	-0.45	4.49	0.01	0.03	320.20	0.25	17.35
	24	1.79	5.46	0.01	0.03	332.44	0.23	20.03
	25	3.10	6.19	0.01	0.03	344.68	0.22	21.96
	26	-4.29	+6.66	-0.01	+0.03	356.90	+0.20	23.09
	27	5.30	6.85	0.01	0.03	9.13	0.18	23.34
	28	6.07	6.73	0.01	0.03	21.34	0.16	22.59
	29	6.52	6.28	0.01	0.03	33.56	0.13	20.73
	30	6.61	5.50	0.01	0.03	45.76	0.11	17.64
July	1	-6.32	+4.40	-0.01	+0.03	57.96	+0.08	13.32
	2	-5.63	+3.01	-0.01	+0.03	70.16	+0.05	7.93

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
July 1	-6.32	+4.40	-0.01	+0.03	57.96	+0.08	13.32
2	5.63	3.01	0.01	0.03	70.16	0.05	7.93
3	4.58	+1.40	0.01	0.03	82.35	+0.01	1.86
4	3.22	-0.33	0.01	0.03	94.54	-0.02	355.65
5	-1.65	2.06	-0.01	0.03	106.73	0.06	349.87
6	+0.03	-3.66	0.00	+0.03	118.92	-0.10	344.91
7	1.69	5.01	0.00	0.03	131.12	0.13	341.02
8	3.22	6.01	0.00	0.03	143.32	0.17	338.32
9	4.53	6.61	0.00	0.03	155.53	0.20	336.86
10	5.54	6.79	0.00	0.03	167.74	0.23	336.67
11	+6.23	-6.57	0.00	+0.03	179.96	-0.27	337.77
12	6.58	5.98	0.00	0.03	192.19	0.30	340.13
13	6.59	5.09	0.00	0.03	204.42	0.32	343.63
14	6.31	3.95	0.00	0.03	216.66	0.35	348.08
15	5.76	2.64	0.00	0.03	228.91	0.38	353.15
16	+4.99	-1.22	0.00	+0.03	241.15	-0.40	358.48
17	4.04	+0.23	0.00	0.03	253.40	0.43	3.71
18	2.93	1.66	0.00	0.03	265.65	0.45	8.56
19	1.70	3.00	0.00	0.03	277.90	0.47	12.85
20	+0.41	4.19	0.00	0.03	290.16	0.49	16.47
21	-0.93	+5.21	0.00	+0.03	302.40	-0.51	19.37
22	2.27	6.00	0.00	0.03	314.65	0.52	21.52
23	3.56	6.53	0.00	0.03	326.89	0.54	22.88
24	4.74	6.79	0.00	0.03	339.13	0.56	23.40
25	5.78	6.76	0.00	0.03	351.36	0.58	22.98
26	-6.59	+6.41	0.00	+0.03	3.58	-0.59	21.52
27	7.11	5.75	0.00	0.03	15.80	0.61	18.93
28	7.30	4.78	0.00	0.03	28.01	0.63	15.15
29	7.08	3.53	0.00	0.03	40.22	0.66	10.26
30	6.44	2.04	0.00	0.03	52.41	0.68	4.51
31	-5.36	+0.38	0.00	+0.03	64.60	-0.71	358.35
Aug. 1	3.88	-1.35	0.00	0.03	76.79	0.74	352.31
2	2.09	3.02	0.00	0.03	88.98	0.77	346.86
3	-0.10	4.49	0.00	0.03	101.16	0.80	342.44
4	+1.92	5.64	0.00	0.03	113.35	0.83	339.17
5	+3.79	-6.39	+0.01	+0.03	125.54	-0.86	337.19
6	5.39	6.70	0.01	0.03	137.74	0.89	336.56
7	6.60	6.57	0.01	0.03	149.94	0.92	337.30
8	7.37	6.05	0.01	0.03	162.14	0.94	339.38
9	7.68	5.21	0.01	0.03	174.35	0.97	342.67
10	+7.58	-4.11	+0.01	+0.03	186.57	-0.99	346.96
11	7.11	2.84	0.01	0.03	198.80	1.02	351.93
12	6.34	1.46	0.01	0.03	211.03	1.04	357.22
13	5.35	-0.03	0.01	0.03	223.26	1.06	2.48
14	4.20	+1.38	0.01	0.03	235.50	1.08	7.42
15	+2.93	+2.71	+0.01	+0.03	247.74	-1.10	11.84
16	+1.61	+3.92	+0.01	+0.03	259.98	-1.12	15.64

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Aug. 16	+1.61	+3.92	+0.01	+0.03	259.98	-1.12	15.64
17	+0.27	4.95	0.01	0.03	272.23	1.13	18.73
18	-1.06	5.77	0.01	0.03	284.47	1.15	21.08
19	2.36	6.34	+0.01	0.03	296.71	1.16	22.65
20	3.58	6.64	0.00	0.03	308.95	1.17	23.39
21	-4.72	+6.66	0.00	+0.03	321.19	-1.18	23.21
22	5.71	6.37	0.00	0.03	333.42	1.19	22.05
23	6.53	5.79	0.00	0.03	345.64	1.20	19.81
24	7.11	4.92	0.00	0.03	357.86	1.21	16.45
25	7.40	3.79	0.00	0.03	10.07	1.22	12.02
26	-7.32	+2.42	0.00	+0.03	22.27	-1.23	6.70
27	6.83	+0.88	0.00	0.03	34.47	1.24	0.81
28	5.89	-0.76	+0.01	0.03	46.66	1.26	354.82
29	4.51	2.40	0.01	0.03	58.84	1.28	349.18
30	2.75	3.92	0.01	0.03	71.02	1.30	344.30
31	-0.70	-5.17	+0.01	+0.03	83.20	-1.31	340.46
Sept. 1	+1.46	6.06	0.01	0.03	95.37	1.33	337.86
2	3.53	6.52	0.01	0.03	107.55	1.35	336.62
3	5.34	6.51	0.01	0.03	119.72	1.37	336.83
4	6.74	6.08	0.01	0.03	131.90	1.38	338.49
5	+7.65	-5.29	+0.01	+0.03	144.09	-1.40	341.49
6	8.04	4.22	0.01	0.03	156.28	1.42	345.62
7	7.95	2.96	0.01	0.03	168.48	1.43	350.54
8	7.44	1.58	0.01	0.03	180.68	1.44	355.86
9	6.59	-0.17	0.01	0.03	192.89	1.46	1.20
10	+5.50	+1.23	+0.01	+0.03	205.10	-1.47	6.25
11	4.25	2.55	0.01	0.03	217.32	1.48	10.82
12	2.92	3.75	0.01	0.04	229.55	1.49	14.78
13	1.56	4.78	0.01	0.04	241.77	1.50	18.05
14	+0.22	5.61	0.01	0.04	254.00	1.51	20.60
15	-1.06	+6.20	+0.01	+0.04	266.23	-1.51	22.38
16	2.26	6.52	0.01	0.04	278.46	1.52	23.33
17	3.37	6.55	0.01	0.04	290.69	1.52	23.38
18	4.36	6.30	0.01	0.04	302.92	1.52	22.44
19	5.23	5.74	0.01	0.04	315.14	1.52	20.45
20	-5.94	+4.92	+0.01	+0.04	327.36	-1.52	17.37
21	6.47	3.84	0.01	0.04	339.57	1.51	13.25
22	6.76	2.54	0.01	0.03	351.78	1.51	8.24
23	6.76	+1.08	0.01	0.03	3.98	1.51	2.63
24	6.41	-0.48	0.01	0.03	16.17	1.51	356.81
25	-5.68	-2.05	+0.01	+0.03	28.36	-1.51	351.18
26	4.52	3.53	0.01	0.03	40.53	1.51	346.13
27	2.99	4.81	0.01	0.03	52.70	1.51	341.94
28	-1.15	5.79	0.01	0.03	64.87	1.51	338.82
29	+0.86	6.36	0.01	0.03	77.03	1.51	336.97
30	+2.86	-6.49	+0.01	+0.03	89.19	-1.51	336.52
Oct. 1	+4.66	-6.17	+0.01	+0.03	101.35	-1.52	337.56

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Oct. 1	+4.66	-6.17	+0.01	+0.03	101.35	-1.52	337.56
2	6.11	5.45	0.02	0.03	113.51	1.52	340.08
3	7.09	4.41	0.02	0.03	125.67	1.52	343.91
4	7.57	3.14	0.02	0.03	137.84	1.52	348.72
5	7.55	1.74	0.02	0.03	150.01	1.52	354.09
6	+7.09	-0.30	+0.01	+0.04	162.19	-1.52	359.58
7	6.27	+1.13	0.01	0.04	174.38	1.52	4.83
8	5.19	2.47	0.01	0.04	186.57	1.52	9.61
9	3.93	3.69	0.01	0.04	198.76	1.52	13.77
10	2.60	4.73	0.01	0.04	210.96	1.52	17.25
11	+1.25	+5.57	+0.01	+0.04	223.17	-1.52	20.01
12	-0.05	6.18	0.01	0.04	235.38	1.51	22.01
13	1.25	6.52	0.01	0.04	247.59	1.51	23.20
14	2.32	6.57	0.01	0.04	259.80	1.50	23.49
15	3.25	6.33	0.01	0.04	272.02	1.49	22.81
16	-4.03	+5.79	+0.01	+0.04	284.23	-1.48	21.07
17	4.67	4.96	0.01	0.04	296.44	1.47	18.21
18	5.14	3.88	0.01	0.04	308.65	1.46	14.28
19	5.46	2.59	0.01	0.04	320.86	1.44	9.44
20	5.58	+1.14	0.01	0.04	333.06	1.43	3.95
21	-5.49	-0.39	+0.01	+0.04	345.25	-1.41	358.22
22	5.14	1.93	0.01	0.04	357.44	1.39	352.62
23	4.50	3.39	0.01	0.03	9.62	1.38	347.52
24	3.56	4.67	0.01	0.03	21.79	1.36	343.18
25	2.32	5.68	0.01	0.03	33.95	1.35	339.78
26	-0.84	-6.33	+0.01	+0.03	46.11	-1.33	337.50
27	+0.80	6.57	0.01	0.03	58.26	1.32	336.48
28	2.44	6.37	0.01	0.03	70.40	1.30	336.88
29	3.96	5.75	0.01	0.03	82.55	1.28	338.77
30	5.20	4.77	0.01	0.03	94.69	1.27	342.08
31	+6.08	-3.51	+0.01	+0.03	106.83	-1.25	346.58
Nov. 1	6.52	2.08	0.01	0.04	118.98	1.24	351.88
2	6.52	-0.58	0.01	0.04	131.13	1.22	357.50
3	6.11	+0.91	0.01	0.04	143.28	1.21	3.00
4	5.36	2.32	0.01	0.04	155.44	1.19	8.06
5	+4.34	+3.59	+0.01	+0.04	167.61	-1.18	12.51
6	3.13	4.69	0.01	0.04	179.78	1.17	16.25
7	1.83	5.58	0.01	0.04	191.96	1.16	19.26
8	+0.52	6.22	0.01	0.04	204.14	1.14	21.51
9	-0.74	6.61	0.01	0.04	216.33	1.13	22.96
10	-1.86	+6.71	+0.01	+0.04	228.52	-1.12	23.55
11	2.83	6.50	0.01	0.04	240.72	1.10	23.18
12	3.60	6.00	0.01	0.04	252.91	1.08	21.76
13	4.15	5.20	0.01	0.04	265.11	1.07	19.20
14	4.50	4.12	0.01	0.04	277.31	1.05	15.51
15	-4.64	+2.82	+0.01	+0.04	289.51	-1.02	10.80
16	-4.60	+1.34	+0.01	+0.04	301.71	-1.00	5.35

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C	
	Long.	Lat.	Long.	Lat.	Colong.	Lat.		
Nov.	16	-4.60	+1.34	+0.01	+0.04	301.71	-1.00	5.35
	17	4.37	-0.24	0.01	0.04	313.90	0.97	359.56
	18	3.96	1.82	0.01	0.04	326.09	0.95	353.85
	19	3.39	3.31	0.01	0.04	338.28	0.92	348.61
	20	2.64	4.62	0.01	0.04	350.45	0.89	344.10
	21	-1.73	-5.67	+0.01	+0.04	2.62	-0.86	340.51
	22	-0.68	6.38	0.01	0.04	14.78	0.83	337.97
	23	+0.48	6.69	0.01	0.04	26.93	0.80	336.61
	24	1.67	6.59	0.01	0.04	39.08	0.77	336.54
	25	2.82	6.08	0.01	0.04	51.22	0.74	337.86
	26	+3.85	-5.19	+0.01	+0.04	63.35	-0.71	340.59
	27	4.67	4.00	0.01	0.04	75.49	0.68	344.61
	28	5.21	2.60	0.01	0.04	87.62	0.65	349.63
	29	5.43	-1.07	0.01	0.04	99.75	0.62	355.20
	30	5.32	+0.48	0.01	0.04	111.88	0.60	0.85
Dec.	1	+4.87	+1.97	+0.01	+0.04	124.02	-0.57	6.19
	2	4.13	3.33	0.01	0.04	136.16	0.55	10.96
	3	3.15	4.52	0.01	0.04	148.31	0.53	15.03
	4	1.99	5.48	0.01	0.04	160.46	0.50	18.34
	5	+0.73	6.21	+0.01	0.04	172.61	0.48	20.87
	6	-0.56	+6.66	0.00	+0.04	184.77	-0.47	22.60
	7	1.79	6.84	0.00	0.04	196.94	0.45	23.50
	8	2.91	6.72	0.00	0.04	209.11	0.43	23.47
	9	3.83	6.30	0.00	0.04	221.29	0.41	22.44
	10	4.52	5.57	0.00	0.04	233.48	0.39	20.30
	11	-4.94	+4.56	0.00	+0.04	245.66	-0.36	17.01
	12	5.06	3.29	0.00	0.04	257.85	0.34	12.60
	13	4.88	1.81	0.00	0.04	270.04	0.32	7.28
	14	4.43	+0.20	0.00	0.04	282.23	0.29	1.42
	15	3.74	-1.45	0.00	0.04	294.42	0.26	355.49
	16	-2.86	-3.03	0.00	+0.04	306.61	-0.23	349.94
	17	1.84	4.43	0.00	0.04	318.80	0.20	345.11
	18	-0.74	5.56	0.00	0.04	330.97	0.16	341.22
	19	+0.38	6.35	0.00	0.04	343.14	0.13	338.41
	20	1.46	6.74	0.00	0.04	355.31	0.10	336.77
	21	+2.46	-6.72	0.00	+0.04	7.46	-0.06	336.39
	22	3.34	6.30	0.00	0.04	19.61	-0.02	337.34
	23	4.06	5.51	0.00	0.04	31.76	+0.01	339.64
	24	4.59	4.40	0.00	0.04	43.89	0.05	343.21
	25	4.90	3.07	0.00	0.04	56.02	0.09	347.85
	26	+5.00	-1.58	0.00	+0.04	68.15	+0.12	353.20
	27	4.85	-0.04	0.00	0.04	80.28	0.16	358.82
	28	4.47	+1.48	0.00	0.04	92.41	0.19	4.30
	29	3.86	2.90	0.00	0.04	104.54	0.22	9.32
	30	3.04	4.17	0.00	0.04	116.67	0.25	13.68
	31	+2.03	+5.22	0.00	+0.04	128.80	+0.28	17.29
	32	+0.88	+6.03	0.00	+0.04	140.94	+0.30	20.12

624 ILLUMINATED DISK OF MERCURY, 1917.

FOR GREENWICH MEAN NOON.

Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.	Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.
		°	°					°	°		
Jan. 1	0.650	72	352	59.1	-0.4	July 5	0.934	30	185	67.5	-1.4
6	0.451	96	347	61.5	-0.1	10	0.993	9	212	65.6	1.8
11	0.212	125	342	41.8	+0.8	15	0.990	12	344	57.8	1.6
16	0.035	158	324	8.4	2.1	20	0.947	27	3	48.7	1.1
21	0.026	161	204	6.0	2.3	25	0.888	39	11	41.2	0.7
26	0.158	133	184	27.6	+1.2	30	0.827	49	16	36.1	-0.3
31	0.322	110	178	39.5	0.7	Aug. 4	0.766	58	19	33.0	-0.1
Feb. 5	0.464	94	175	40.3	0.4	9	0.707	66	22	31.4	+0.1
10	0.573	82	171	37.1	0.2	14	0.646	73	24	30.9	0.3
15	0.656	72	168	33.5	0.2	19	0.580	81	26	31.2	0.4
20	0.721	64	164	30.8	+0.1	24	0.504	90	28	32.1	+0.6
25	0.775	57	160	29.2	0.0	29	0.415	100	30	32.7	0.7
Mar. 2	0.821	50	157	28.6	-0.1	Sept. 3	0.309	112	32	31.4	0.9
7	0.862	44	153	29.1	0.2	8	0.188	129	36	25.2	1.3
12	0.901	37	150	31.0	0.4	13	0.071	149	44	12.3	2.0
17	0.939	29	146	34.4	-0.7	18	0.006	171	96	1.3	+2.9
22	0.972	19	142	39.9	1.0	23	0.056	153	192	11.5	2.0
27	0.996	7	125	47.9	1.5	28	0.228	123	203	40.6	+0.8
Apr. 1	0.994	9	351	58.0	1.6	Oct. 3	0.464	94	207	63.2	-0.1
6	0.943	28	337	67.4	1.4	8	0.681	69	209	66.5	0.6
11	0.826	49	336	70.3	-1.1	13	0.835	48	211	57.8	-0.9
16	0.663	71	336	64.4	-0.6	18	0.925	32	212	46.8	1.0
21	0.489	91	337	53.0	0.0	23	0.971	20	213	38.0	1.0
26	0.330	110	338	40.0	+0.6	28	0.993	10	214	31.9	1.0
May 1	0.198	127	339	27.2	1.2	Nov. 2	1.000	2	225	28.0	1.0
6	0.094	144	340	14.6	+1.9	7	0.998	5	21	25.6	-0.8
11	0.026	162	342	4.4	2.6	12	0.991	11	22	24.6	0.7
16	0.000	178	40	0.0	3.5	17	0.978	17	20	24.7	0.6
21	0.020	164	149	3.3	2.8	22	0.959	23	17	25.9	0.5
26	0.075	148	152	11.2	2.1	27	0.932	30	14	28.4	0.4
31	0.154	134	154	19.8	+1.6	Dec. 2	0.893	38	10	32.4	-0.4
June 5	0.243	121	156	27.0	1.2	7	0.834	48	6	38.5	0.4
10	0.340	109	158	33.0	0.8	12	0.745	61	2	46.7	0.4
15	0.446	96	161	38.8	+0.5	17	0.608	78	358	55.5	-0.3
20	0.562	83	165	45.6	0.0	22	0.412	100	354	57.0	+0.1
25	0.691	68	169	53.7	-0.4	27	0.181	130	350	36.7	+0.9
30	0.824	50	176	62.3	-0.9	32	0.019	164	328	4.8	+2.3

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ =the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR GREENWICH MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.885	39.6	189.5	61.0	-3.4	July 5	0.945	27.2	8.7	52.2	-3.3
6	0.895	37.8	186.7	59.5	3.4	10	0.936	29.2	10.9	52.9	3.3
11	0.904	36.0	183.7	58.2	3.4	15	0.927	31.2	12.9	53.8	3.3
16	0.913	34.3	180.6	57.0	3.4	20	0.918	33.2	14.8	54.8	3.3
21	0.921	32.5	177.5	55.8	3.4	25	0.908	35.3	16.4	55.8	3.3
26	0.929	30.9	174.3	54.7	-3.4	30	0.898	37.3	17.9	56.9	-3.3
31	0.937	29.2	171.2	53.7	3.3	Aug. 4	0.887	39.3	19.2	58.1	3.3
Feb. 5	0.944	27.5	168.1	52.8	3.3	9	0.876	41.2	20.2	59.4	3.4
10	0.950	25.8	165.2	51.9	3.3	14	0.864	43.2	21.1	60.8	3.4
15	0.956	24.1	162.4	51.2	3.3	19	0.852	45.2	21.7	62.3	3.4
20	0.962	22.4	159.8	50.5	-3.3	24	0.840	47.1	22.1	64.0	-3.4
25	0.967	20.8	157.3	49.8	3.3	29	0.827	49.1	22.3	65.8	3.4
Mar. 2	0.972	19.2	155.0	49.2	3.4	Sept. 3	0.814	51.1	22.3	67.8	3.4
7	0.977	17.5	152.9	48.7	3.4	8	0.801	53.0	22.0	70.0	3.4
12	0.981	15.8	151.0	48.2	3.4	13	0.787	55.0	21.5	72.3	3.5
17	0.985	14.2	149.3	47.8	-3.4	18	0.773	57.0	20.8	74.8	-3.5
22	0.988	12.5	147.6	47.5	3.4	23	0.758	58.9	19.8	77.6	3.5
27	0.991	10.8	146.0	47.2	3.4	28	0.743	60.9	18.7	80.6	3.5
Apr. 1	0.994	9.1	144.2	47.0	3.4	Oct. 3	0.727	62.9	17.3	84.0	3.6
6	0.996	7.4	142.2	46.8	3.4	8	0.712	65.0	15.7	87.6	3.6
11	0.998	5.6	139.2	46.7	-3.4	13	0.695	67.0	13.9	91.5	-3.6
16	0.999	4.0	133.7	46.6	3.5	18	0.678	69.1	11.9	95.9	3.7
21	1.000	2.3	119.8	46.6	3.5	23	0.661	71.2	9.7	100.7	3.7
26	1.000	1.3	69.0	46.6	3.5	28	0.643	73.4	7.5	105.9	3.7
May 1	1.000	2.2	11.6	46.7	3.5	Nov. 2	0.624	75.7	5.1	111.7	3.8
6	0.999	3.8	356.2	46.8	-3.5	7	0.604	78.0	2.7	118.0	-3.8
11	0.998	5.6	351.5	47.0	3.4	12	0.584	80.4	0.3	125.0	3.9
16	0.996	7.5	350.0	47.2	3.4	17	0.562	82.9	357.9	132.5	3.9
21	0.993	9.4	350.2	47.5	3.4	22	0.539	85.5	355.6	140.8	4.0
26	0.990	11.3	351.2	47.8	3.4	27	0.515	88.2	353.3	149.8	4.0
31	0.987	13.3	352.7	48.2	-3.4	Dec. 2	0.490	91.1	351.2	159.4	-4.1
June 5	0.983	15.2	354.6	48.6	3.4	7	0.463	94.2	349.2	169.9	4.2
10	0.978	17.2	356.8	49.0	3.4	12	0.434	97.6	347.4	180.8	4.2
15	0.972	19.2	359.2	49.6	3.4	17	0.404	101.1	345.7	192.0	4.3
20	0.966	21.2	1.6	50.1	3.4	22	0.370	105.1	344.1	202.5	4.3
25	0.960	23.2	4.0	50.7	-3.3	27	0.334	109.4	342.6	212.0	-4.4
30	0.953	25.2	6.4	51.4	-3.3	32	0.295	114.2	341.0	218.4	-4.4

NOTATION.

k = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i = the angle between the Sun and Earth, as seen from the planet.

θ = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L = the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

39398°—1917—40

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus} + 180^{\circ}$	D_{\oplus}	$A_{\odot} - A_{\oplus}$	D_{\odot}	\odot_{\oplus}
	m		.	.	.	.	.	.
Oct. 1	15.98	+1.6	358.10	221.05	+16.95	-29.59	+ 5.05	12.51
3	15.87	1.6	358.84	222.25	17.29	29.92	5.43	13.46
5	15.76	1.6	359.57	223.45	17.63	30.24	5.80	14.41
7	15.64	1.6	0.30	224.64	17.95	30.57	6.18	15.35
9	15.52	1.6	1.02	225.84	18.26	30.89	6.55	16.29
11	15.41	+1.6	1.75	227.04	+18.57	-31.22	+ 6.91	17.23
13	15.29	1.6	2.46	228.23	18.86	31.54	7.28	18.16
15	15.16	1.5	3.18	229.42	19.15	31.86	7.64	19.10
17	15.04	1.5	3.88	230.60	19.42	32.18	8.00	20.03
19	14.92	1.5	4.59	231.79	19.69	32.50	8.36	20.96
21	14.79	+1.5	5.28	232.97	+19.94	-32.82	+ 8.71	21.89
23	14.66	1.5	5.98	234.15	20.18	33.13	9.07	22.81
25	14.53	1.5	6.66	235.32	20.42	33.43	9.42	23.73
27	14.40	1.5	7.34	236.49	20.64	33.74	9.76	24.66
29	14.27	1.4	8.02	237.65	20.85	34.04	10.10	25.57
31	14.13	+1.4	8.68	238.82	+21.05	-34.33	+10.44	26.49
Nov. 2	14.00	1.4	9.34	239.97	21.24	34.63	10.78	27.40
4	13.86	1.4	9.99	241.12	21.43	34.91	11.12	28.32
6	13.72	1.4	10.64	242.27	21.60	35.19	11.45	29.23
8	13.58	1.4	11.27	243.41	21.76	35.46	11.78	30.14
10	13.44	+1.3	11.90	244.54	+21.91	-35.73	+12.10	31.05
12	13.30	1.3	12.52	245.66	22.05	35.98	12.42	31.95
14	13.15	1.3	13.13	246.78	22.18	36.23	12.74	32.86
16	13.00	1.3	13.73	247.88	22.30	36.47	13.05	33.76
18	12.86	1.3	14.32	248.98	22.41	36.70	13.36	34.66
20	12.71	+1.2	14.91	250.07	+22.51	-36.92	+13.67	35.56
22	12.56	1.2	15.48	251.14	22.60	37.12	13.98	36.46
24	12.41	1.2	16.04	252.21	22.68	37.32	14.28	37.36
26	12.26	1.2	16.59	253.26	22.76	37.50	14.57	38.25
28	12.11	1.1	17.13	254.30	22.82	37.66	14.87	39.14
30	11.95	+1.1	17.66	255.33	+22.87	-37.82	+15.16	40.04
Dec. 2	11.80	1.1	18.17	256.34	22.92	37.95	15.44	40.93
4	11.65	1.1	18.68	257.34	22.96	38.08	15.72	41.82
6	11.49	1.0	19.17	258.33	22.98	38.18	16.00	42.71
8	11.33	1.0	19.65	259.30	23.00	38.27	16.28	43.60
10	11.19	+1.0	20.12	260.25	+23.02	-38.34	+16.55	44.48
12	11.02	1.0	20.57	261.18	23.02	38.39	16.81	45.37
14	10.86	0.9	20.91	262.10	23.02	38.42	17.07	46.26
16	10.70	0.9	21.44	262.99	23.01	38.43	17.33	47.14
18	10.55	0.8	21.85	263.86	22.99	38.42	17.59	48.02
20	10.39	+0.8	22.25	264.71	+22.97	-38.38	+17.84	48.90
22	10.23	0.8	22.63	265.54	22.94	38.32	18.08	49.78
24	10.07	0.8	23.00	266.34	22.91	38.23	18.32	50.66
26	9.91	0.7	23.36	267.12	22.87	38.12	18.56	51.54
28	9.75	0.7	23.70	267.88	22.83	37.98	18.79	52.42
30	9.60	+0.6	24.02	268.61	+22.78	-37.81	+19.02	53.30
32	9.44	+0.6	24.33	269.31	+22.73	-37.62	+19.24	54.13

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN NOON.

FOR GREENWICH MEAN NOON.							Mean Time of Transit of Zero Meridian.		
Date.	<i>k</i>	Diameter.	<i>i</i>	<i>q</i>	<i>Q</i>	Central Meridian.	Of Date.	Of Intermediate Date.	
		"	°	"	°	°	h m	h m	
Oct.	1	0.927	5.25	31.32	0.38	287.00	288.41	4 54.3	5 34.1
	3	0.926	5.29	31.57	0.39	287.35	269.03	6 14.0	6 53.8
	5	0.925	5.33	31.82	0.40	287.69	249.64	7 33.6	8 13.5
	7	0.924	5.37	32.06	0.41	288.00	230.26	8 53.3	9 33.2
	9	0.923	5.41	32.29	0.42	288.33	210.87	10 13.0	10 52.8
	11	0.922	5.45	32.53	0.43	288.64	191.49	11 32.7	12 12.5
	13	0.920	5.49	32.76	0.44	288.94	172.11	12 52.3	13 32.2
	15	0.919	5.53	32.98	0.45	289.22	152.74	14 12.0	14 51.8
	17	0.918	5.58	33.20	0.46	289.50	133.36	15 31.6	16 11.4
	19	0.917	5.63	33.42	0.47	289.76	113.99	16 51.2	17 31.0
	21	0.916	5.68	33.63	0.48	290.02	94.63	18 10.8	18 50.6
	23	0.915	5.72	33.84	0.49	290.26	75.26	19 30.4	20 10.2
	25	0.914	5.78	34.04	0.50	290.50	55.91	20 50.0	21 29.7
	27	0.913	5.83	34.24	0.50	290.72	36.56	22 9.5	22 49.3
	29	0.912	5.88	34.43	0.51	290.94	17.21	23 29.0	...
	31	0.911	5.94	34.61	0.52	291.14	357.86	0 8.8	0 48.6
Nov.	2	0.911	6.00	34.79	0.54	291.33	338.52	1 28.3	2 8.0
	4	0.910	6.06	34.97	0.55	291.52	319.19	2 47.8	3 27.5
	6	0.909	6.12	35.14	0.56	291.69	299.86	4 7.2	4 46.9
	8	0.908	6.18	35.30	0.57	291.85	280.54	5 26.6	6 6.3
	10	0.907	6.25	35.45	0.58	292.00	261.23	6 46.0	7 25.6
	12	0.907	6.31	35.59	0.59	292.15	241.92	8 5.3	8 45.0
	14	0.906	6.38	35.73	0.60	292.28	222.62	9 24.6	10 4.3
	16	0.905	6.45	35.86	0.61	292.40	203.34	10 43.9	11 23.5
	18	0.905	6.53	35.97	0.62	292.52	184.06	12 3.1	12 42.7
	20	0.904	6.60	36.08	0.63	292.62	164.80	13 22.3	14 1.8
	22	0.904	6.68	36.18	0.64	292.72	145.54	14 41.4	15 21.0
	24	0.903	6.76	36.27	0.65	292.81	126.30	16 0.5	16 40.0
	26	0.903	6.85	36.35	0.67	292.88	107.06	17 19.5	17 59.0
	28	0.902	6.93	36.42	0.68	292.95	87.85	18 38.5	19 17.9
	30	0.902	7.02	36.47	0.69	293.01	68.64	19 57.4	20 36.8
	Dec.	2	0.902	7.11	36.51	0.70	293.06	49.45	21 16.2	21 55.6
4		0.902	7.21	36.54	0.71	293.10	30.27	22 35.0	23 14.4
6		0.902	7.30	36.56	0.72	293.14	11.11	23 53.7	...
8		0.902	7.40	36.56	0.73	293.16	351.96	0 33.0	1 12.4
10		0.902	7.51	36.55	0.74	293.18	332.83	1 51.6	2 30.9
12		0.902	7.62	36.52	0.75	293.19	313.72	3 10.2	3 49.4
14		0.902	7.73	36.48	0.76	293.19	294.63	4 28.6	5 7.8
16		0.902	7.84	36.42	0.76	293.18	275.56	5 47.0	6 26.1
18		0.903	7.96	36.34	0.77	293.17	256.51	7 5.2	7 44.3
20		0.903	8.08	36.24	0.78	293.14	237.48	8 23.4	9 2.4
22		0.904	8.20	36.12	0.79	293.11	218.47	9 41.4	10 20.4
24		0.905	8.33	35.98	0.80	293.07	199.49	10 59.4	11 38.4
26		0.905	8.47	35.82	0.80	293.03	180.53	12 17.3	12 56.2
28		0.906	8.60	35.64	0.81	292.97	161.60	13 35.0	14 13.9
30		0.907	8.74	35.43	0.81	292.91	142.70	14 52.7	15 31.4
32		0.909	8.89	35.20	0.81	292.84	123.82	16 10.1	...

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.	Light-Time.	Stellar Magnitude.	P	$A_{\odot}+180^{\circ}$	D_{\odot}	$A_{\odot}+180^{\circ}$	D_{\odot}
	m		.	.	.	.	.
Jan. 1	38.42	-2.1	337.30	249.92	+2.88	260.94	+3.03
8	39.34	2.1	337.37	250.28	2.85	261.58	3.04
15	40.27	2.0	337.47	250.80	2.83	262.21	3.04
22	41.20	2.0	337.60	251.46	2.81	262.85	3.04
29	42.13	1.9	337.77	252.27	2.80	263.48	3.05
Feb. 5	43.03	-1.9	337.96	253.20	+2.79	264.12	+3.05
12	43.91	1.8	338.19	254.24	2.79	264.76	3.06
19	44.75	1.8	338.45	255.39	2.79	265.39	3.06
26	45.55	1.8	338.73	256.64	2.79	266.02	3.06
Mar. 5	46.29	1.7	339.05	257.96	2.79	266.66	3.06
12	46.98	-1.7	339.40	259.36	+2.80	267.29	+3.07
19	47.60	1.7	339.78	260.82	2.81	267.93	3.07
26	48.15	1.6	340.18	262.33	2.82	268.56	3.07
Apr. 2	48.64	1.6	340.61	263.89	2.83	269.20	3.07
9	49.04	1.6	341.07	265.48	2.85	269.83	3.07
June 5	49.39	-1.6	345.51	278.88	+2.94	274.97	+3.06
12	49.07	1.6	346.10	280.48	2.95	275.60	3.06
19	48.68	1.6	346.69	282.04	2.95	276.23	3.05
26	48.22	1.6	347.28	283.56	2.96	276.86	3.05
July 3	47.69	1.6	347.87	285.03	2.97	277.49	3.04
10	47.10	-1.7	348.43	286.45	+2.98	278.12	+3.04
17	46.45	1.7	348.98	287.80	2.98	278.74	3.03
24	45.74	1.7	349.51	289.08	2.99	279.37	3.03
31	44.99	1.8	350.01	290.28	2.99	280.00	3.02
Aug. 7	44.19	1.8	350.48	291.39	3.00	280.62	3.02
14	43.36	-1.8	350.91	292.40	+3.01	281.25	+3.01
21	42.50	1.9	351.30	293.30	3.01	281.87	3.00
28	41.63	1.9	351.63	294.07	3.02	282.50	3.00
Sept. 4	40.74	2.0	351.92	294.72	3.02	283.12	2.99
11	39.86	2.0	352.14	295.23	3.03	283.75	2.98
18	38.99	-2.1	352.29	295.59	+3.04	284.37	+2.97
25	38.14	2.1	352.38	295.79	3.05	284.99	2.96
Oct. 2	37.33	2.2	352.40	295.83	3.05	285.62	2.96
9	36.57	2.2	352.35	295.70	3.06	286.24	2.95
16	35.88	2.2	352.22	295.41	3.07	286.86	2.94
23	35.26	-2.3	352.02	294.96	+3.07	287.48	+2.93
30	34.73	2.3	351.77	294.37	3.07	288.10	2.92
Nov. 6	34.31	2.3	351.46	293.65	3.07	288.72	2.91
13	33.99	2.4	351.10	292.82	3.07	289.34	2.90
20	33.80	2.4	350.71	291.92	3.06	289.96	2.89
27	33.73	-2.4	350.31	290.97	+3.05	290.58	+2.87
Dec. 4	33.79	2.4	349.91	290.02	3.03	291.20	2.86
11	33.98	2.4	349.52	289.10	3.01	291.82	2.85
18	34.29	2.3	349.16	288.23	2.99	292.43	2.84
25	34.71	2.3	348.85	287.47	2.96	293.05	2.82
32	35.25	-2.3	348.59	286.82	+2.94	293.67	+2.81

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN NOON.

Date.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	<i>i</i>	<i>q</i>	<i>Q</i>	Central Meridian.		Correction for Phase.
							System I.	System II.	
		"	"	"	"	"	"	"	"
Jan.	1	43.34	2.62	11.00	0.40	68.38	16.63	176.53	-0.53
	8	42.34	2.56	11.28	0.41	68.60	41.01	147.51	0.55
	15	41.36	2.50	11.40	0.41	68.82	65.22	118.32	0.56
	22	40.42	2.45	11.37	0.40	69.07	89.29	88.98	0.56
	29	39.53	2.39	11.20	0.38	69.33	113.22	59.51	0.55
Feb.	5	38.70	2.34	10.91	0.35	69.62	137.04	29.92	-0.52
	12	37.92	2.29	10.50	0.32	69.93	180.76	0.23	0.48
	19	37.21	2.25	10.00	0.28	70.27	184.39	330.46	0.44
	26	36.56	2.21	9.39	0.25	70.65	207.97	300.63	0.38
Mar.	5	35.97	2.18	8.69	0.21	71.07	231.49	270.75	0.33
	12	35.45	2.15	7.93	0.17	71.53	254.97	240.82	-0.27
	19	34.98	2.12	7.10	0.13	72.06	278.43	210.88	0.22
	26	34.58	2.09	6.23	0.10	72.64	301.88	180.92	0.17
Apr.	2	34.24	2.07	5.31	0.07	73.32	325.33	150.96	0.12
	9	33.96	2.05	4.35	0.05	74.19	348.79	121.02	-0.08
June	5	33.71	2.04	3.91	0.04	253.63	335.48	32.79	+0.07
	12	33.93	2.05	4.87	0.06	254.68	359.38	3.28	0.10
	19	34.20	2.07	5.80	0.09	255.57	23.35	333.84	0.15
	26	34.53	2.09	6.69	0.12	256.37	47.41	304.49	0.20
July	3	34.92	2.11	7.53	0.15	257.11	71.57	275.23	0.25
	10	35.36	2.14	8.32	0.19	257.79	95.81	246.06	+0.30
	17	35.85	2.17	9.04	0.23	258.43	120.16	217.00	0.36
	24	36.41	2.20	9.70	0.26	259.02	144.61	188.03	0.41
	31	37.02	2.24	10.27	0.30	259.58	169.17	159.18	0.46
Aug.	7	37.68	2.28	10.75	0.33	260.11	193.84	130.44	0.50
	14	38.40	2.32	11.13	0.36	260.59	218.64	101.82	+0.54
	21	39.18	2.37	11.40	0.39	261.03	243.57	73.33	0.56
	28	40.00	2.42	11.56	0.41	261.43	263.62	44.98	0.58
Sept.	4	40.87	2.47	11.58	0.42	261.79	293.81	16.75	0.58
	11	41.78	2.53	11.47	0.42	262.08	319.14	348.67	0.57
	18	42.71	2.58	11.20	0.41	262.33	344.62	320.73	+0.54
	25	43.66	2.64	10.78	0.38	262.53	10.23	292.93	0.50
Oct.	2	44.60	2.70	10.19	0.35	262.68	35.99	265.27	0.45
	9	45.53	2.75	9.45	0.31	262.79	61.88	237.74	0.39
	16	46.41	2.81	8.54	0.26	262.86	87.89	210.34	0.32
	23	47.22	2.86	7.47	0.20	262.92	114.01	183.05	+0.24
	30	47.94	2.90	6.26	0.14	263.02	140.23	155.85	0.17
Nov.	6	48.54	2.94	4.92	0.09	263.24	166.50	128.72	0.10
	13	48.99	2.96	3.47	0.04	263.85	192.82	101.63	0.05
	20	49.27	2.98	1.96	0.01	265.76	219.15	74.54	+0.02
	27	49.37	2.99	0.43	0.00	284.11	245.44	47.42	0.00
Dec.	4	49.28	2.98	1.19	0.01	71.73	271.65	20.22	-0.01
	11	49.01	2.97	2.71	0.03	76.18	297.76	352.93	0.03
	18	48.57	2.94	4.20	0.06	77.20	323.74	325.49	0.08
	25	47.97	2.90	5.58	0.11	77.58	349.54	297.89	0.14
	32	47.24	2.86	6.83	0.17	77.73	15.16	270.10	-0.20

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM I.

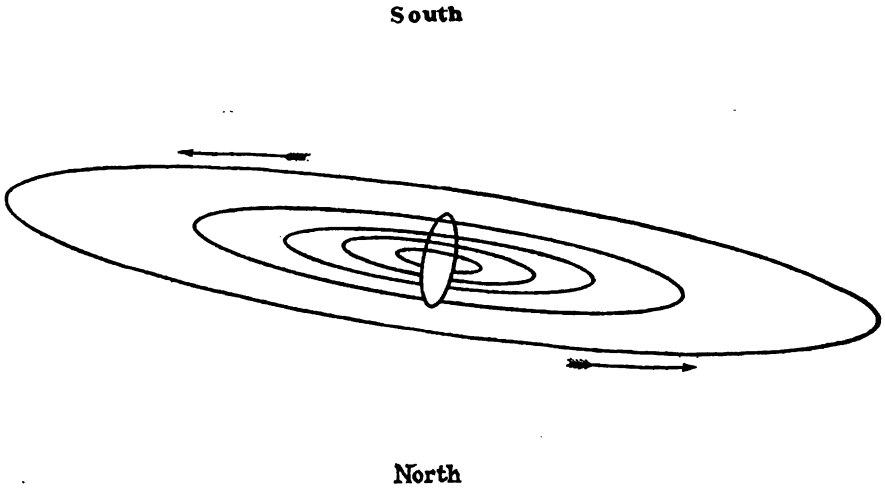
GREENWICH MEAN TIME.

Transit of Zero Meridian.	Interval between Successive Transits.	Transit of Zero Meridian.	Interval between Successive Transits.	Transit of Zero Meridian.	Interval between Successive Transits.
Jan. d h m 1 9 24.17 3 10 37.10 5 11 50.05 7 13 3.03 9 14 16.03 11 15 29.05 13 16 42.09 15 17 55.15 17 19 8.22 19 20 21.32 21 21 34.43 23 22 47.56 26 0 0.71 28 1 13.87 30 2 27.05	h m 9 50.59 9 50.61 9 50.63	June d h m 5 0 40.13 7 1 53.30 9 3 6.45 11 4 19.60 13 5 32.74 15 6 45.86 17 7 58.97 19 9 12.07 21 10 25.15 23 11 38.22 25 12 51.28 27 14 4.33 29 15 17.36 July 1 16 30.38 3 17 43.39	h m 9 50.63 9 50.62 9 50.61	Sept. d h m 19 15 46.25 21 16 58.63 23 18 10.99 25 19 23.33 27 20 35.65 29 21 47.95 Oct. 1 23 0.24 4 0 12.50 6 1 24.75 8 2 36.99 10 3 49.21 12 5 1.41 14 6 13.60 16 7 25.76 18 8 37.92	h m 9 50.47 9 50.45 9 50.44
Feb. 1 3 40.24 3 4 53.44 5 6 6.66 7 7 19.89 9 8 33.13 11 9 46.39 13 10 59.65 15 12 12.92 17 13 26.20 19 14 39.49 21 15 52.79 23 17 6.10 25 18 19.41 27 19 32.73	9 50.64 9 50.65 9 50.66	16 1 1.13 18 2 14.04 20 3 26.93 22 4 39.82 24 5 52.68 26 7 5.52 28 8 18.36 30 9 31.18 Aug. 1 10 43.98 3 11 56.77 5 13 9.54 7 14 22.29 9 15 35.03 11 16 47.75 13 18 0.46 15 19 13.15 17 20 25.82 19 21 38.48 21 22 51.12 24 0 3.74 26 1 16.35 28 2 28.94 30 3 41.51 Sept. 1 4 54.06 3 6 6.60 5 7 19.12 7 8 31.62 9 9 44.10 11 10 56.57 13 12 9.02 15 13 21.45 17 14 33.86	9 50.59 9 50.58 9 50.56 9 50.55 9 50.53 9 50.51 9 50.50 9 50.48	20 9 50.06 22 11 2.19 24 12 14.30 26 13 26.40 28 14 38.50 30 15 50.57 Nov. 1 17 2.64 3 18 14.70 5 19 26.75 7 20 38.80 9 21 50.84 11 23 2.87 14 0 14.89 16 1 26.92 18 2 38.94 20 3 50.97 22 5 3.00 24 6 15.03 26 7 27.07 28 8 39.12 30 9 51.17 Dec. 2 11 3.24 4 12 15.32 6 13 27.43 8 14 39.55 10 15 51.69 12 17 3.86 14 18 16.05 16 19 28.26 18 20 40.50 20 21 52.77 22 23 5.06 25 0 17.38 27 1 29.73 29 2 42.10 31 3 54.50 33 5 6.93	9 50.42 9 50.41 9 50.40 9 50.41 9 50.42 9 50.44 9 50.46 9 50.49
Mar. 1 20 46.06 3 21 59.39 5 23 12.73 8 0 26.07 10 1 39.42 12 2 52.77 14 4 6.13 16 5 19.48 18 6 32.84 20 7 46.21 22 8 59.57 24 10 12.94 26 11 26.31 28 12 39.67 30 13 53.04	9 50.67 9 50.67 9 50.67				
Apr. 1 15 6.41 3 16 19.78 5 17 33.14 7 18 46.50 9 19 59.87 11 21 13.23	9 50.67				

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM II.

GREENWICH MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.	Transit of Zero Meridian.				Interval between Successive Transits.	Transit of Zero Meridian.				Interval between Successive Transits.
d	h	m		h m	d	h	m		h m	d	h	m		h m
Jan.	1	5	4.49	9 55.77	June	5	9	1.44	9 55.81	Sept.	20	22	33.66	9 55.65
	3	6	43.31			7	10	40.50			23	0	11.91	
	5	8	22.15			9	12	19.56			25	1	50.14	
	7	10	1.02			11	13	58.60			27	3	28.36	
	9	11	39.91			13	15	37.63			29	5	6.55	
	11	13	18.82	9 55.79		15	17	16.65	9 55.80	Oct.	1	6	44.73	9 55.63
	13	14	57.75			17	18	55.65			3	8	22.89	
	15	16	36.70			19	20	34.64			5	10	1.04	
	17	18	15.67			21	22	13.62			7	11	39.15	
	19	19	54.66			23	23	52.59			9	13	17.25	
	21	21	33.67	9 55.81		26	1	31.54	9 55.78		11	14	55.34	9 55.61
	23	23	12.69			28	3	10.48			13	16	33.41	
	26	0	51.73			30	4	49.41			15	18	11.47	
	28	2	30.79		July	2	6	28.32			17	19	49.51	
	30	4	9.86			4	8	7.22			19	21	27.54	
Feb.	1	5	48.95	9 55.82		6	9	46.10	9 55.77		21	23	5.55	9 55.60
	3	7	28.05			8	11	24.97			24	0	43.55	
	5	9	7.16			10	13	3.82			26	2	21.53	
	7	10	46.29			12	14	42.66			28	3	59.50	
	9	12	25.43			14	16	21.49			30	5	37.46	
	11	14	4.58	9 55.83		16	18	0.31	9 55.76	Nov.	1	7	15.41	9 55.59
	13	15	43.74			18	19	30.10			3	8	53.35	
	15	17	22.91			20	21	17.89			5	10	31.29	
	17	19	2.09			22	22	56.65			7	12	9.21	
	19	20	41.28			25	0	35.41			9	13	47.12	
	21	22	20.48	9 55.84		27	2	14.14	9 55.74		11	15	25.04	9 55.58
	23	23	59.69			29	3	52.86			13	17	2.94	
	26	1	38.90			31	5	31.57			15	18	40.84	
	28	3	18.12		Aug.	2	7	10.26			17	20	18.75	
Mar.	2	4	57.34			4	8	48.93			19	21	56.65	
	4	6	36.58	9 55.85		6	10	27.59	9 55.73		21	23	34.55	9 55.58
	6	8	15.81			8	12	6.23			24	1	12.47	
	8	9	55.06			10	13	44.85			26	2	50.38	
	10	11	34.31			12	15	23.46			28	4	28.31	
	12	13	13.56			14	17	2.05			30	6	6.24	
	14	14	52.81	9 55.85		16	18	40.62	9 55.71	Dec.	2	7	44.19	9 55.60
	16	16	32.07			18	20	19.18			4	9	22.15	
	18	18	11.33			20	21	57.72			6	11	0.13	
	20	19	50.59			22	23	36.24			8	12	38.13	
	22	21	29.85			25	1	14.74			10	14	16.15	
	24	23	9.12	9 55.85		27	2	53.23	9 55.69		12	15	54.19	9 55.62
	27	0	48.39			29	4	31.70			14	17	32.26	
	29	2	27.66			31	6	10.15			16	19	10.35	
	31	4	6.93		Sept.	2	7	48.58			18	20	48.47	
Apr.	2	5	46.19			4	9	27.00			20	22	26.62	
	4	7	25.46	9 55.85		6	11	5.39	9 55.67		23	0	4.79	9 55.65
	6	9	4.72			8	12	43.77			25	1	42.99	
	8	10	43.08			10	14	22.14			27	3	21.22	
	10	12	23.25			12	16	0.48			29	4	59.48	
	12	14	2.49			14	17	38.80			31	6	37.77	
.....						16	19	17.11	9 55.65		33	8	16.08	9 55.67
.....						18	20	55.40			35	9	54.41	



APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF OPPOSITION, NOVEMBER 28, 1917, AS SEEN IN AN INVERTING TELESCOPE, AND ELONGATED IN THE RATIO OF THREE TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

In the above diagram the central ellipse represents the disk of Jupiter, and the inner orbit is that of Satellite V.

In the diagrams of the configurations of Jupiter's four brighter satellites, pages 637-657, Jupiter is represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Greenwich time stated above the diagrams are indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s	=	d		d	h	m	s	=	d				
I.	1	18	28	35.946	=	1.769	860	49	V.	0	11	57	27.635	=	0.498	236	52
II.	3	13	17	53.736	=	3.554	094	17	VI.					=	266.00		
III.	7	3	59	35.856	=	7.166	387	22	VII.					=	276.67		
IV.	16	18	5	6.916	=	16.753	552	27									

SATELLITES OF JUPITER, 1917.

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SATELLITE V.

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

Jan.	d	h	E.	Oct.	d	h	E.	Jan.	d	h	W.	Oct.	d	h	W.
	1	10.2	E.		12	22.7	E.		1	16.2	W.		13	4.7	W.
	11	9.3	E.		22	21.8	E.		11	15.3	W.		23	3.8	W.
	21	8.5	E.	Nov.	1	20.9	E.		21	14.5	W.	Nov.	2	2.9	W.
	31	7.7	E.		11	20.0	E.		31	13.7	W.		12	2.0	W.
Sept.	3	2.3	E.		21	19.1	E.	Sept.	3	8.2	W.		22	1.0	W.
	13	1.4	E.	Dec.	1	18.1	E.		13	7.4	W.	Dec.	2	0.1	W.
	23	0.5	E.		11	17.2	E.		23	6.5	W.		11	23.2	W.
Oct.	2	23.6	E.		21	16.3	E.	Oct.	23	5.6	W.		21	22.3	W.
					31	15.4	E.		31				31	21.4	W.

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

Jan.	d	h	m	s	Mar.	d	h	m	s	July	d	h	m	s	Oct.	d	h	m	s
	1	21	29	47		26	2	41	45		20	23	58	36		12	4	14	48
	3	15	58	14		27	21	12	7		22	18	28	15		13	22	41	38
	5	10	26	39		29	15	42	32		24	12	57	48		15	17	8	31
	7	4	55	13		31	10	12	56		26	7	27	21		17	11	35	15
	8	23	23	48	Apr.	2	4	43	20		28	1	56	49		19	6	1	59
	10	17	52	32		3	23	13	45		29	20	26	19		21	0	28	33
	12	12	21	14		5	17	44	12		31	14	55	42		22	18	55	11
	14	6	50	5		7	12	14	39	Aug.	2	9	25	6		24	13	21	39
	16	1	18	56		9	6	45	5		4	3	54	24		26	7	48	9
	17	19	47	57		11	1	15	31		5	22	23	44		28	2	14	29
	19	14	16	54		12	19	46	0		7	16	52	57		29	20	40	53
	21	8	46	1		14	14	16	28		9	11	22	10		31	15	7	8
	23	3	15	7		16	8	46	55		11	5	51	17	Nov.	2	9	33	26
	24	21	44	22		18	3	17	22		13	0	20	27		4	3	59	34
	26	16	13	34		19	21	47	52		14	18	49	28		5	22	25	46
	28	10	42	54		21	16	18	21		16	13	18	30		7	16	51	50
	30	5	12	14		..	..	..	..		18	7	47	25		9	11	17	58
	31	23	41	43		..	..	..	..		20	2	16	22		11	5	43	56
Feb.	2	18	11	8		..	..	..	..		21	20	45	12		13	0	10	0
	4	12	40	40	June	1	9	58	2		23	15	14	1		14	18	35	57
	6	7	10	13		3	4	28	23		25	9	42	42		16	13	1	57
	8	1	39	52		4	22	58	39		27	4	11	27		18	7	27	50
	9	20	9	29		6	17	28	56		28	22	40	3		20	1	53	49
	11	14	39	12		8	11	59	11		30	17	8	39		21	20	19	41
	13	9	8	55		10	6	29	29	Sept.	1	11	37	6		23	14	45	39
	15	3	38	45		12	0	59	39		3	6	5	37		25	9	11	29
	16	22	8	32		13	19	29	51		5	0	33	58		27	3	37	27
	18	16	38	25		15	14	0	2		6	19	2	20		28	22	3	19
	20	11	8	17		17	8	30	14		8	13	30	33		30	16	29	17
	22	5	38	17		19	3	0	21		10	7	58	49	Dec.	2	10	55	9
	24	0	8	13		20	21	30	29		12	2	26	55		4	5	21	10
	25	18	38	14		22	16	0	35		13	20	55	1		5	23	47	5
	27	13	8	15		24	10	30	41		15	15	22	58		7	18	13	9
Mar.	1	7	38	21		26	5	0	43		17	9	50	58		9	12	39	6
	3	2	8	25		27	23	30	45		19	4	18	48		11	7	5	13
	4	20	38	33		29	18	0	45		20	22	46	38		13	1	31	17
	6	15	8	41	July	1	12	30	45		22	17	14	18		14	19	57	29
	8	9	38	54		3	7	0	41		24	11	42	2		16	14	23	36
	10	4	9	4		5	1	30	37		26	6	9	35		18	8	49	54
	11	22	39	17		6	20	0	30		28	0	37	9		20	3	16	8
	13	17	9	31		8	14	30	25		29	19	4	32		21	21	42	32
	15	11	39	49		10	9	0	14	Oct.	1	13	31	59		23	16	8	51
	17	6	10	4		12	3	30	3		3	7	59	15		25	10	35	22
	19	0	40	23		13	21	59	49		5	2	26	32		27	5	1	51
	20	19	10	41		15	16	29	36		6	20	53	38		28	23	28	30
	22	13	41	3		17	10	59	17		8	15	20	49		30	17	55	5
	24	8	11	23		19	5	28	59		10	9	47	48		32	12	21	52

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s
Jan.	1	7	14	45	Mar.	27	15	57	52	July	19	13	40	36	Oct.	12	20	38	27
	4	20	31	0		31	5	24	6		23	3	3	37		16	9	48	50
	8	9	47	49	Apr.	3	18	49	44		26	16	25	48		19	22	58	44
	11	23	5	18		7	8	16	16		30	5	48	3		23	12	8	1
	15	12	23	19		10	21	42	10	Aug.	2	19	9	30		27	1	16	52
											6	8	30	58		30	14	25	12
	19	1	42	0		14	11	8	57		9	21	51	39	Nov.	3	3	33	7
	22	15	1	5		18	0	34	59		13	11	12	12		6	16	40	36
	26	4	20	54		21	14	1	57		17	0	32	1		10	5	47	46
	29	17	41	1		..	..	..	..		20	13	51	38		13	18	54	38
Feb.	2	7	1	53		..	..	..	..						
											24	3	10	33		17	8	1	16
	5	20	22	57	June	..	..	..	..		27	16	29	8		20	21	7	41
	9	9	44	45		3	7	19	48		31	5	47	2		24	10	14	2
	12	23	6	40		6	20	45	19	Sept.	3	19	4	33		27	23	20	19
	16	12	29	20		10	10	11	32		7	8	21	25	Dec.	1	12	26	40
	20	1	52	3		13	23	36	45										
											10	21	37	50		5	1	33	4
	23	15	15	31		17	13	2	38		14	10	53	34		8	14	39	37
	27	4	38	54		21	2	27	30		18	0	8	48		12	3	46	22
Mar.	2	18	3	3		24	15	52	54		21	13	23	22		15	16	53	26
	6	7	27	4		28	5	17	21		25	2	37	25		19	6	0	50
	9	20	51	53	July	1	18	42	15										
											28	15	50	49		22	19	8	36
	13	10	16	23		5	8	6	15	Oct.	2	5	3	36		26	8	16	50
	16	23	41	45		8	21	30	34		5	18	15	49		29	21	25	31
	20	13	6	41		12	10	54	1		9	7	27	24		33	10	34	46
	24	2	32	33		16	0	17	43										

SATELLITE III.

	d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s
Jan.	5	12	3	55	Apr.	1	15	14	21	July	18	10	20	8	Oct.	12	10	17	0
	12	16	0	55		8	19	43	22		25	14	38	49		19	13	47	47
	19	20	3	2		16	0	13	17	Aug.	1	18	55	9		26	17	14	7
	27	0	9	0		..	..	..	..		8	23	9	21	Nov.	2	20	36	53
Feb.	3	4	19	11		..	..	..	..		16	3	19	48		9	23	56	28
	10	8	32	7		..	..	..	..		23	7	26	51		17	3	14	9
	17	12	48	7	June	..	..	..	..		30	11	29	36		24	6	29	38
	24	17	7	0		5	7	48	13	Sept.	6	15	28	20	Dec.	1	9	44	42
Mar.	3	21	28	35		12	12	17	1		13	19	23	11		8	12	59	46
	11	1	52	55		19	16	45	24		20	23	13	38		15	16	16	27
						26	21	11	52										
	18	6	18	39	July	4	1	36	53		28	3	0	1		22	19	36	7
	25	10	46	13		11	5	59	32	Oct.	5	6	40	55		29	22	59	29

SATELLITE IV.

	d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s
Jan.	6	7	33	33	Apr.	17	6	9	23	June	23	17	50	16	Oct.	2	11	11	25
	23	1	41	8		..	..	..	..	July	10	14	16	8		19	3	1	58
Feb.	8	20	41	26		..	..	..	..		27	10	16	35	Nov.	4	17	55	53
	25	16	24	24		..	..	..	..	Aug.	13	5	42	52		21	8	9	8
Mar.	14	12	38	46		..	..	..	..		30	0	26	38	Dec.	7	22	10	10
	31	9	16	28	June	6	21	6	15	Sept.	15	18	18	54		24	12	30	7

DIFFERENTIAL COORDINATES OF SATELLITE VI.

FOR GREENWICH MEAN NOON.

Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	'		m s	'		m s	'
Jan. 0	+4 21	- 5.0	June 18	-2 16	-15.3	Sept. 26	+3 39	-13.2
4	4 20	3.5	22	2 7	16.8	30	3 53	11.1
8	4 18	2.0	26	1 58	18.1	Oct. 4	4 5	8.9
12	4 14	- 0.5	30	1 48	19.4	8	4 16	6.5
16	4 9	+ 0.9	July 4	1 37	20.6	12	4 26	3.9
20	+4 3	+ 2.3	8	-1 26	-21.6	16	+4 33	- 1.3
24	3 55	3.7	12	1 14	22.5	20	4 38	+ 1.4
28	3 46	5.0	16	1 1	23.4	24	4 41	4.2
Feb. 1	3 36	6.3	20	0 47	24.1	28	4 40	7.0
5	3 25	7.5	24	0 33	24.7	Nov. 1	4 37	9.8
9	+3 13	+ 8.7	28	-0 19	-25.1	5	+4 30	+12.6
13	3 0	9.8	Aug. 1	-0 4	25.4	9	4 20	15.3
17	2 46	10.8	5	+0 11	25.6	13	4 6	17.8
21	2 32	11.8	9	0 27	25.6	17	3 49	20.2
25	2 17	12.7	13	0 43	25.5	21	3 28	22.3
Mar. 1	+2 1	+13.5	17	+0 59	-25.2	25	+3 3	+24.0
5	1 44	14.2	21	1 15	24.7	29	2 36	25.4
9	1 27	14.8	25	1 32	24.1	Dec. 3	2 5	26.3
13	1 9	15.2	29	1 48	23.3	7	1 33	26.7
17	0 51	15.6	Sept. 2	2 5	22.4	11	0 59	26.6
21	+0 32	+15.7	6	+2 21	-21.3	15	+0 25	+26.0
25	+0 14	15.7	10	2 38	20.0	19	-0 10	24.9
29	-0 5	15.5	14	2 54	18.6	23	0 43	23.3
Apr. 2	-0 23	+15.1	18	3 10	17.0	27	1 15	21.3
	. . .	. . .	22	+3 25	-15.2	31	-1 44	+19.0

DIFFERENTIAL COORDINATES OF SATELLITE VII.

Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	'		m s	'		m s	'
Jan. 0	-4 39	+ 7.8	June 18	+1 46	- 2.9	Sept. 26	-4 28	+24.2
4	4 32	8.4	22	1 34	1.7	30	4 39	24.0
8	4 23	8.9	26	1 22	- 0.5	Oct. 4	4 48	23.8
12	4 14	9.3	30	1 8	+ 0.8	8	4 56	23.3
16	4 3	9.6	July 4	0 54	2.2	12	5 3	22.7
20	-3 52	+ 9.8	8	+0 40	+ 3.6	16	-5 7	+21.9
24	3 40	10.0	12	0 25	5.1	20	5 9	20.9
28	3 28	10.1	16	+0 10	6.6	24	5 10	19.8
Feb. 1	3 15	10.0	20	-0 6	8.0	28	5 8	18.5
5	3 1	10.0	24	0 22	9.5	Nov. 1	5 3	17.1
9	-2 47	+ 9.8	28	-0 38	+10.9	5	-4 56	+15.6
13	2 33	9.5	Aug. 1	0 54	12.3	9	4 47	14.0
17	2 19	9.2	5	1 11	13.7	13	4 34	12.2
21	2 4	8.7	9	1 27	15.1	17	4 19	10.4
25	1 49	8.3	13	1 44	16.4	21	4 2	8.5
Mar. 1	-1 34	+ 7.7	17	-2 0	+17.6	25	-3 41	+ 6.5
5	1 20	7.1	21	2 17	18.7	29	3 19	4.6
9	1 4	6.4	25	2 33	19.8	Dec. 3	2 54	2.6
13	0 49	5.7	29	2 49	20.8	7	2 28	+ 0.7
17	0 34	4.9	Sept. 2	3 5	21.7	11	2 0	- 1.1
21	-0 19	+ 4.1	6	-3 20	+22.4	15	-1 31	- 2.9
25	-0 4	3.2	10	3 35	23.1	19	1 1	4.6
29	+0 11	2.3	14	3 50	23.6	23	0 31	6.2
Apr. 2	+0 26	+ 1.3	18	4 4	23.9	27	-0 1	7.7
	. . .	. . .	22	-4 16	+24.1	31	+0 28	- 9.0

GREENWICH MEAN TIME.

JANUARY.

d h m s		d h m s		d h m s		d h m s	
1 02240	I. Sh. I.	8 134353	II.*Ec. R.	16 104121	III.*Sh. I.	24 247 9	I. Sh. E.
1 15 1	I. Tr. E.	22 18 9	I. Oc. D.	12 20 7	III.*Sh. E.	8 53 48	II. Tr. I.
2 31 14	I. Sh. E.			21 22 55	I. Tr. I.	11 29 26	II.*Tr. E.
5 56 51	II. Oc. D.	9 1 458	III. Tr. I.	22 42 53	I. Sh. I.	11 36 11	II.*Sh. I.
8 32 41	II. Oc. R.	1 49 13	I. Ec. R.	23 32 29	I. Tr. E.	14 6 59	II.*Sh. E.
8 33 57	II. Ec. D.	3 3 13	III. Tr. E.			20 38 40	I. Oc. D.
11 6 46	II.*Ec. R.	6 38 58	III. Sh. I.	17 05 125	I. Sh. E.		
20 24 11	I. Oc. D.	8 18 15	III. Sh. E.	6 14 48	II. Tr. I.	25 0 937	I. Ec. R.
21 10 56	III. Tr. I.	19 27 55	I. Tr. I.	8 50 19	II. Tr. E.	17 48 7	I. Tr. I.
23 6 33	III. Tr. E.	20 47 13	I. Sh. I.	8 58 25	II. Sh. I.	19 7 29	I. Sh. I.
23 53 27	I. Ec. R.	21 37 20	I. Tr. E.	11 29 28	II.*Sh. E.	19 57 53	I. Tr. E.
		22 55 44	I. Sh. E.	18 42 16	I. Oc. D.	21 16 3	I. Sh. E.
				22 13 56	I. Ec. R.		
2 23559	III. Sh. I.	10 33747	II. Tr. I.			26 3 219	II. Oc. D.
4 15 50	III. Sh. E.	6 13 10	II. Tr. E.	18 15 51 48	I.*Tr. I.	5 39 28	II. Oc. R.
17 34 3	I.*Tr. I.	6 20 30	II. Sh. I.	17 11 46	I. Sh. I.	5 45 0	II. Ec. D.
18 51 35	I. Sh. I.	8 51 50	II. Sh. E.	18 1 24	I. Tr. E.	8 17 37	II. Ec. R.
19 43 20	I. Tr. E.	16 46 53	I.*Oc. D.	19 20 18	I. Sh. E.	15 7 52	I.*Oc. D.
21 0 8	I. Sh. E.	20 18 12	I. Ec. R.			18 38 30	I. Ec. R.
				19 02334	II. Oc. D.	23 6 18	III. Oc. D.
3 1 253	II. Tr. I.	11 135632	I.*Tr. I.	3 026	II. Oc. R.		
3 38 5	II. Tr. E.	15 16 5	I.*Sh. I.	3 7 23	II. Ec. D.	27 1 11 43	III. Oc. R.
3 42 24	II. Sh. I.	16 5 59	I.*Tr. E.	5 40 3	II. Ec. R.	4 41 3	III. Ec. D.
6 14 3	II. Sh. E.	17 24 36	I. Sh. E.	13 11 13	I.*Oc. D.	6 22 12	III. Ec. R.
14 52 37	I.*Oc. D.	21 47 3	II. Oc. D.	16 42 49	I.*Ec. R.	12 17 23	I.*Tr. I.
18 22 27	I. Ec. R.			19 1 2	III. Oc. D.	13 36 28	I.*Sh. I.
		12 02333	II. Oc. R.	21 5 3	III. Oc. R.	14 27 12	I.*Tr. E.
4 12 223	I.*Tr. I.	0 29 53	II. Ec. D.			15 45 3	I.*Sh. E.
13 20 27	I.*Sh. I.	3 2 37	II. Ec. R.	20 03840	III. Ec. D.	22 14 10	II. Tr. I.
14 11 42	I.*Tr. E.	11 15 35	I.*Oc. D.	2 20 13	III. Ec. R.		
15 28 59	I.*Sh. E.	14 47 5	I.*Ec. R.	10 20 49	I. Tr. I.	28 0 49 49	II. Tr. E.
19 12 58	II. Oc. D.	14 59 49	III.*Oc. D.	11 40 45	I.*Sh. I.	0 55 7	II. Sh. I.
21 49 3	II. Oc. R.	17 2 1	III.*Oc. R.	12 30 29	I.*Tr. E.	3 25 48	II. Sh. E.
21 52 35	II. Ec. D.	20 35 44	III. Ec. D.	13 49 17	I.*Sh. E.	9 37 12	I. Oc. D.
		22 17 46	III. Ec. R.	19 34 17	II. Tr. I.	13 7 26	I.*Ec. R.
5 02523	II. Ec. R.			22 9 51	II. Tr. E.		
9 21 2	I. Oc. D.	13 82517	I. Tr. I.	22 17 29	II. Sh. I.	29 6 46 39	I. Tr. I.
11 3 59	III.*Oc. D.	9 45 3	I. Sh. I.			8 5 21	I. Sh. I.
12 51 20	I.*Ec. R.	10 34 47	I. Tr. E.	31 04823	II. Sh. E.	8 56 30	I. Tr. E.
13 3 51	III.*Oc. R.	11 53 34	I.*Sh. E.	7 40 19	I. Oc. D.	10 13 59	I. Sh. E.
16 33 24	III.*Ec. D.	16 56 18	II.*Tr. I.	11 11 46	I.*Ec. R.	16 22 23	II.*Oc. D.
18 15 56	III. Ec. R.	19 31 44	II. Tr. E.			18 59 38	II. Oc. R.
		19 39 40	II. Sh. I.	23 44951	I. Tr. I.	19 3 41	II. Ec. D.
6 63051	I. Tr. I.	22 10 50	II. Sh. E.	6 9 38	I. Sh. I.	21 36 16	II. Ec. R.
7 49 24	I. Sh. I.			6 59 32	I. Tr. E.		
8 40 12	I. Tr. E.	14 54425	I. Oc. D.	8 18 12	I. Sh. E.	30 4 632	I. Oc. D.
9 57 56	I. Sh. E.	9 16 3	I. Ec. R.	13 42 35	II.*Oc. D.	7 36 19	I. Ec. R.
14 20 22	II.*Tr. I.			16 19 35	II.*Oc. R.	13 13 6	III.*Tr. I.
16 55 38	II.*Tr. E.	15 254 3	I. Tr. I.	16 26 2	II.*Ec. D.	15 16 22	III.*Tr. E.
17 1 42	II.*Sh. I.	4 13 56	I. Sh. I.	18 58 39	II. Ec. R.	18 45 35	III. Sh. I.
19 33 10	II. Sh. E.	5 3 35	I. Tr. E.			20 23 32	III. Sh. E.
		6 22 28	I. Sh. E.	23 2 925	I. Oc. D.		
7 34935	I. Oc. D.	11 4 59	II.*Oc. D.	5 40 39	I. Ec. R.	31 1 16 2	I. Tr. I.
7 20 18	I. Ec. R.	13 41 39	II.*Oc. R.	9 6 10	III. Tr. I.	2 34 20	I. Sh. I.
		13 48 31	II.*Ec. D.	11 8 13	III.*Tr. E.	3 25 55	I. Tr. E.
8 05919	I. Tr. I.	16 21 12	II.*Ec. R.	14 43 32	III.*Sh. I.	4 42 57	I. Sh. E.
2 18 16	I. Sh. I.			16 21 53	III.*Sh. E.	11 34 35	II.*Tr. I.
3 8 43	I. Tr. E.	16 0 13 15	I. Oc. D.	23 18 59	I. Tr. I.	14 10 16	II.*Tr. E.
4 26 48	I. Sh. E.	3 44 57	I. Ec. R.			14 13 44	II.*Sh. I.
8 29 41	II. Oc. D.	5 3 20	III. Tr. I.	24 03836	I. Sh. I.	16 44 21	II. Sh. E.
11 5 58	II.*Oc. R.	7 3 42	III. Tr. E.	1 28 42	I. Tr. E.	22 36 0	I. Oc. D.
11 11 9	II.*Ec. D.						

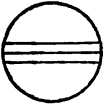
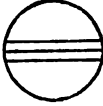
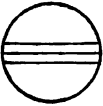
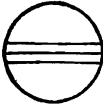
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		* r	III.		* d * r
II.		* d * r	IV. No Eclipse.		

Configurations at 14^h 0^m for an Inverting Telescope.

Day.	West.	East.
1	4. .1 ○ ³ / ₂	
2	.4 .3. ○ 1. 2.	
3	.4 .3. .2. .0 1	
4	○ 1. .4 .3 .2 ○	
5		.4 ○ ₃ .1 .2
6		1. ³ / ₂ ○ .4 .3
7		.2 ○ .1 .4 3.
8		.1 ○ .2 3. .4
9		3. ○ 1. 2. .4
10	3. .2. .1 ○	4.
11	○ 1. .3 .2 ○	4.
12		.0 3 .2 4. .1 ●
13		1. ○ 2. ⁴ / ₃
14		2. 4 ○ .1 3.
15		4. 1. ○ 3. .2 ●
16	4. 3. ○ 1. 2.	
17	4. 3. ³ / ₁ ○	
18	4. .3 .2 ○ 1.	
19	.4 .3 ○ .2 .1 ●	
20	.4 1. ○ 2. 3	
21	.4 2. ○ .1 .3	
22		¹ / ₄ ○ 3. .2 ●
23		3. ○ ¹ / ₄ 2.
24	3. .12. ○	.4
25	.3 .2 ○ 1.	.4
26		.3 .0 1 .2 .4
27	○ 1.	○ 2. 3 4.
28		2. ○ .1 .3 4.
29		1. .2 ○ 3. 4.
30	○ 3.	○ .1 ⁴ / ₂
31	○ 2.	3. .1 ⁴ / ₂ ○

GREENWICH MEAN TIME.

FEBRUARY.

d h m s		d h m s		d h m s		d h m s	
1 2 5 16	I. Ec. R.	9 19 3 47	I. Oc. D.	17 21 32 35	I. Sh. E.	26 15 48 17	I. Sh. I.
19 45 24	I. Tr. I.	22 29 43	I. Ec. R.			16 52 42	I. Tr. E.
21 3 13	I. Sh. I.			18 6 23 14	II. Tr. I.	17 57 23	I. Sh. E.
21 55 20	I. Tr. E.	10 7 28 37	III. Oc. D.	8 46 50	II. Sh. I.		
23 11 52	I. Sh. E.	9 35 38	III. Oc. R.	8 58 51	II. Tr. E.	27 3 20 6	II. Oc. D.
		12 45 24	III.*Ec. D.	11 17 5	II. Sh. E.	8 7 52	II. Ec. R.
2 5 43 12	II. Oc. D.	14 25 58	III.*Ec. R.	15 32 45	I. Oc. D.	12 2 37	I.*Oc. D.
8 20 35	II. Oc. R.	16 13 15	I. Tr. I.	18 54 5	I. Ec. R.	15 18 19	I. Ec. R.
8 22 46	II. Ec. D.	17 27 56	I. Sh. I.				
10 55 20	II. Ec. R.	18 23 24	I. Tr. E.	19 12 42 12	I.*Tr. I.	28 6 18 15	III. Tr. I.
17 5 25	I. Oc. D.	19 36 43	I. Sh. E.	13 52 34	I.*Sh. I.	8 23 9	III. Tr. E.
20 34 8	I. Ec. R.			14 52 35	I.*Tr. E.	9 12 17	I. Tr. I.
		11 3 38 51	II. Tr. I.	16 1 31	I. Sh. E.	10 17 14	I. Sh. I.
3 3 15 59	III. Oc. D.	6 9 48	II. Sh. I.			10 55 18	III. Sh. I.
5 22 23	III. Oc. R.	6 14 31	II. Tr. E.	20 0 33 15	II. Oc. D.	11 22 51	I. Tr. E.
8 43 36	III. Ec. D.	8 40 10	II. Sh. E.	5 29 50	II. Ec. R.	12 28 23	I.*Sh. E.
10 24 27	III. Ec. R.	13 33 31	I.*Oc. D.	10 2 38	I. Oc. D.	12 32 20	III.*Sh. E.
14 14 54	I.*Tr. I.	16 58 36	I. Ec. R.	13 22 55	I.*Ec. R.	22 31 53	II. Tr. I.
15 32 12	I.*Sh. I.						
16 24 52	I. Tr. E.	12 10 42 55	I. Tr. I.	21 1 56 54	III. Tr. I.		
17 40 52	I. Sh. E.	11 56 50	I.*Sh. I.	4 1 48	III. Tr. E.		
		12 53 7	I.*Tr. E.	6 52 35	III. Sh. I.		
4 0 55 45	II. Tr. I.	14 5 39	I.*Sh. E.	7 12 11	I. Tr. I.		
3 31 26	II. Tr. E.	21 47 53	II. Oc. D.	8 21 32	I. Sh. I.		
3 32 33	II. Sh. I.			8 29 43	III. Sh. E.		
6 3 3	II. Sh. E.	13 2 51 51	II. Ec. R.	9 22 35	I. Tr. E.		
11 34 58	I.*Oc. D.	8 3 14	I. Oc. D.	10 30 31	I. Sh. E.		
15 3 3	I.*Ec. R.	11 27 27	I.*Ec. R.	19 45 46	II. Tr. I.		
		21 38 57	III. Tr. I.	22 5 13	II. Sh. I.		
5 8 44 22	I. Tr. I.	23 43 36	III. Tr. E.	22 21 22	II. Tr. E.		
10 1 5	I. Sh. I.						
10 54 24	I. Tr. E.	14 2 50 18	III. Sh. I.	23 0 35 25	II. Sh. E.		
12 9 48	I.*Sh. E.	4 27 36	III. Sh. E.	4 32 37	I. Oc. D.		
19 4 13	II. Oc. D.	5 12 43	I. Tr. I.	7 51 49	I. Ec. R.		
		6 25 48	I. Sh. I.				
6 0 14 1	II. Ec. R.	7 22 57	I. Tr. E.	23 1 42 5	I. Tr. I.		
6 4 30	I. Oc. D.	8 34 39	I. Sh. E.	2 50 24	I. Sh. I.		
9 31 55	I. Ec. R.	17 0 45	II. Tr. I.	3 52 32	I. Tr. E.		
17 23 57	III. Tr. I.	19 28 16	II. Sh. I.	4 59 25	I. Sh. E.		
19 28 5	III. Tr. E.	19 36 26	II. Tr. E.	13 56 42	II.*Oc. D.		
22 47 38	III. Sh. I.	21 58 35	II. Sh. E.	18 49 7	II. Ec. R.		
				23 2 34	I. Oc. D.		
7 0 25 14	III. Sh. E.	15 2 33 4	I. Oc. D.				
3 13 59	I. Tr. I.	5 56 22	I. Ec. R.	24 2 20 38	I. Ec. R.		
4 30 4	I. Sh. I.	23 42 27	I. Tr. I.	16 3 21	III. Oc. D.		
5 24 2	I. Tr. E.			18 10 38	III. Oc. R.		
6 38 47	I. Sh. E.	16 0 54 41	I. Sh. I.	20 12 9	I. Tr. I.		
14 16 58	II.*Tr. I.	1 52 44	I. Tr. E.	20 48 43	III. Ec. D.		
16 51 5	II. Sh. I.	3 3 33	I. Sh. E.	21 19 23	I. Sh. I.		
16 52 39	II. Tr. E.	11 10 32	II. Oc. D.	22 22 39	I. Tr. E.		
19 21 32	II. Sh. E.	16 11 5	II. Ec. R.	22 28 49	III. Ec. R.		
		21 2 52	I. Oc. D.	23 28 27	I. Sh. E.		
8 0 34 10	I. Oc. D.						
4 0 51	I. Ec. R.	17 0 25 13	I. Ec. R.	25 9 8 47	II. Tr. I.		
21 43 32	I. Tr. I.	11 44 29	III.*Oc. D.	11 23 40	II. Sh. I.		
22 58 57	I. Sh. I.	13 51 46	III.*Oc. R.	11 44 19	II.*Tr. E.		
23 53 38	I. Tr. E.	16 47 1	III. Ec. D.	13 53 49	II.*Sh. E.		
		18 12 21	I. Tr. I.	17 32 36	I. Oc. D.		
9 1 7 42	I. Sh. E.	18 27 21	III. Ec. R.	20 49 30	I. Ec. R.		
8 25 59	II. Oc. D.	19 23 40	I. Sh. I.				
13 33 9	II.*Ec. R.	20 22 41	I. Tr. E.	26 14 42 10	I.*Tr. I.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

MARCH.

d h m s		d h m s		d h m s		d h m s	
1 041 59	II. Sh. I.	9 1933 8	II. Oc. D.	18 5 15 54	I. Sh. E.	26 4 30 16	I. Ec. R.
1 7 23	II. Tr. E.			7 21 36	III. Oc. R.	22 47 0	I. Tr. I.
3 12 7	II. Sh. E.	10 0 5 26	II. Ec. R.	8 54 40	III. Ec. D.	23 30 48	I. Sh. I.
6 32 44	I. Oc. D.	3 3 30	I. Oc. D.	10 34 23	III. Ec. B.		
9 47 11	I. Ec. R.	6 11 15	I. Ec. R.	17 30 46	II. Tr. I.	27 0 58 5	I. Tr. E.
				19 12 54	II. Sh. I.	1 40 30	I. Sh. E.
2 3 42 20	I. Tr. I.	11 0 13 28	I. Tr. I.	20 5 48	II. Tr. E.	14 39 22	II. Oc. D.
4 46 6	I. Sh. I.	0 49 39	III. Oc. D.	21 42 54	II. Sh. E.	18 40 39	II. Ec. R.
5 52 57	I. Tr. E.	1 10 45	I. Sh. I.	23 34 52	I. Oc. D.	20 6 39	I. Oc. D.
6 55 16	I. Sh. E.	2 24 16	I. Tr. E.			22 59 0	I. Ec. R.
16 44 16	II. Oc. D.	2 56 11	III. Oc. R.	19 2 35 12	I. Ec. R.		
21 27 14	II. Ec. R.	3 20 7	I. Sh. E.	20 45 11	I. Tr. I.	28 17 17 34	I. Tr. I.
		4 52 56	III. Ec. D.	21 35 14	I. Sh. I.	17 59 44	I. Sh. I.
3 1 2 48	I. Oc. D.	6 32 42	III. Ec. R.	22 56 9	I. Tr. E.	19 28 39	I. Tr. E.
4 15 59	I. Ec. R.	14 42 41	II. Tr. I.	23 44 48	I. Sh. E.	20 9 28	I. Sh. E.
20 25 5	III. Oc. D.	16 36 40	II. Sh. I.				
22 12 33	I. Tr. I.	17 17 55	II. Tr. E.	20 11 48 4	II. Oc. D.	29 0 1 47	III. Tr. I.
22 32 5	III. Oc. R.	19 6 42	II. Sh. E.	16 2 23	II. Ec. R.	2 4 42	III. Tr. E.
23 15 5	I. Sh. I.	21 33 44	I. Oc. D.	18 5 11	I. Oc. D.	3 2 22	III. Sh. I.
				21 3 58	I. Ec. R.	4 39 28	III. Sh. E.
4 0 23 12	I. Tr. E.	12 0 40 3	I. Ec. R.			9 43 53	II. Tr. I.
0 50 33	III. Ec. D.	18 43 44	I. Sh. I.	21 15 15 40	I. Tr. I.	11 6 51	II. Sh. I.
1 24 18	I. Sh. E.	19 39 37	I. Tr. I.	16 4 10	I. Sh. I.	12 18 33	II. *Tr. E.
2 30 28	III. Ec. R.	20 54 34	I. Tr. E.	17 26 39	I. Tr. E.	13 36 48	II. Sh. E.
11 5 19	II. *Tr. I.	21 49 2	I. Sh. E.	18 13 46	I. Sh. E.	14 37 6	I. Oc. D.
14 0 17	II. *Sh. I.			19 33 24	III. Tr. I.	17 27 46	I. Ec. R.
14 30 44	II. *Tr. E.	13 8 57 40	II. Oc. D.	21 37 3	III. Tr. E.		
16 30 22	II. Sh. E.	13 24 10	II. *Ec. R.	23 0 47	III. Sh. I.	30 11 48 0	I. Tr. I.
19 32 57	I. Oc. D.	16 3 58	I. Oc. D.			12 28 33	I. *Sh. I.
22 44 49	I. Ec. R.	19 8 50	I. Ec. R.	23 0 37 48	III. Sh. E.	13 59 8	I. Tr. E.
				6 55 0	II. Tr. I.	14 38 19	I. Sh. E.
5 16 42 42	I. Tr. I.	14 13 14 6	I. *Tr. I.	8 30 56	II. Sh. I.		
17 43 58	I. Sh. I.	14 8 34	I. Sh. I.	9 29 56	II. Tr. E.	31 4 5 38	II. Oc. D.
18 53 24	I. Tr. E.	15 6 34	III. Tr. I.	11 0 55	II. Sh. E.	8 0 10	II. Ec. R.
19 53 13	I. Sh. E.	15 24 58	I. Tr. E.	12 35 34	I. *Oc. D.	9 7 30	I. Oc. D.
		16 18 1	I. Sh. E.	15 32 45	I. Ec. R.	11 56 30	I. Ec. R.
6 6 8 18	II. Oc. D.	17 10 50	III. Tr. E.				
10 46 0	II. Ec. R.	18 59 9	III. Sh. I.	23 9 46 2	I. Tr. I.		
14 3 5	I. *Oc. D.	20 36 9	III. Sh. E.	10 33 0	I. Sh. I.		
17 13 37	I. Ec. R.			11 57 4	I. *Tr. E.		
				12 42 38	I. *Sh. E.		
7 10 41 27	III. Tr. I.	15 4 6 38	II. Tr. I.				
11 12 57	I. Tr. I.	5 54 49	II. Sh. I.				
12 12 55	I. *Sh. I.	6 41 47	II. Tr. E.	24 1 13 58	II. Oc. D.		
12 46 7	III. *Tr. E.	8 24 51	II. Sh. E.	5 21 54	II. Ec. R.		
13 23 40	I. *Tr. E.	10 34 17	I. Oc. D.	7 5 54	I. Oc. D.		
14 22 13	I. *Sh. E.	13 37 39	I. *Ec. R.	10 1 81	I. Ec. R.		
14 57 21	III. Sh. I.						
16 34 21	III. Sh. E.	16 7 44 23	I. Tr. I.	25 4 16 34	I. Tr. I.		
		8 37 24	I. Sh. I.	5 1 57	I. Sh. I.		
8 1 18 53	II. Tr. I.	9 55 18	I. Tr. E.	6 27 37	I. Tr. E.		
3 18 29	II. Sh. I.	10 46 54	I. Sh. E.	7 11 37	I. Sh. E.		
3 54 13	II. Tr. E.	22 23 4	II. Oc. D.	9 43 39	III. Oc. D.		
5 48 34	II. Sh. E.			11 48 48	III. Oc. R.		
8 33 19	I. Oc. D.	17 2 43 38	II. Ec. R.	12 56 30	III. *Ec. D.		
11 42 28	I. *Ec. R.	5 4 33	I. Oc. D.	14 36 14	III. Ec. R.		
		8 6 26	I. Ec. R.	20 19 23	II. Tr. I.		
9 5 43 7	I. Tr. I.	18 2 14 50	I. Tr. I.	21 48 54	II. Sh. I.		
6 41 46	I. Sh. I.	3 6 23	I. Sh. I.	22 54 11	II. Tr. E.		
7 53 54	I. Tr. E.	4 25 46	I. Tr. E.				
8 51 6	I. Sh. E.	5 15 42	III. Oc. D.	26 0 18 52	II. Sh. E.		
				1 36 17	I. Oc. D.		



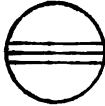
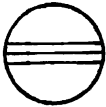
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV: No Eclipse.	

Configurations at 13^h 0^m for an Inverting Telescope.

Day.	West.	East.
1	3. 2. ○	1. 4.
2	3. 1. 2. ○	4.
3	3. ○ 1. 2.	4.
4	○ 2. 1. ○ 3. 4.	
5	2. ○ 1. 4. 3.	
6	4. ○ 1. 2. 3.	
7	○ 1. 4. 3. 2. ○	2.
8	4. 3. 2. ○ 1.	
9	4. 3. 1. ○	
10	4. 3. ○ 1. 2.	
11	4. 1. 2. ○ 3.	
12	4. 2. ○ 1. 3.	
13	4. 1. ○ 3.	2. ●
14	1. ○ 2.	
15	3. 2. ○ 4.	1. ●
16	3. 2. 1. ○ 4.	
17	3. ○ 1. 2. 4.	
18	1. ○ 3. 4.	
19	2. ○ 1. 3. 4.	
20	1. ○ 3. 4. 2. ●	
21	○ 1. 2. 4.	
22	3. 2. ○ 4.	1. ●
23	3. 2. 4. 1. ○	
24	4. 3. ○ 1. 2.	
25	4. 1. ○ 2. 3. ●	
26	4. 2. ○ 1. 3.	
27	4. 1. ○ 2. 3.	
28	4. ○ 1. 3. 2.	
29	4. 3. 1. ○	
30	○ 1. 3. 4. ○	
31	3. ○ 1. 2.	

GREENWICH MEAN TIME.

APRIL.

d h m s		d h m s		d h m s		d h m s	
1 6 18 36	I. Tr. I.	5 19 22 41	I. Ec. R.	11 23 33 22	I. Tr. E.	17 5 17 10	I. Sh. I.
6 57 29	I. Sh. I.					7 5 13	I. Tr. E.
8 29 45	I. Tr. E.	6 13 50 15	I. Tr. I.	12 0 0 39	I. Sh. E.	7 27 12	I. Sh. E.
9 7 17	I. Sh. E.	14 24 2	I. Sh. I.	9 3 1	III. Tr. I.	23 16 55	II. Oc. D.
14 12 12	III. Oc. D.	16 1 26	I. Tr. E.	11 4 11	III. Tr. E.		
16 16 30	III. Oc. R.	16 33 55	I. Sh. E.	11 6 13	III. Sh. I.	18 2 12 3	I. Oc. D.
16 57 32	III. Ec. D.			12 43 33	III.*Sh. E.	2 35 22	II. Ec. R.
18 37 19	III. Ec. R.	7 6 57 57	II. Oc. D.	15 22 40	II. Tr. I.	4 43 33	I. Ec. R.
23 8 28	II. Tr. I.	10 38 26	II. Ec. R.	16 18 9	II. Sh. I.	23 24 41	I. Tr. I.
		11 9 15	I. Oc. D.	17 56 44	II. Tr. E.	23 46 3	I. Sh. I.
2 0 24 44	II. Sh. I.	13 51 24	I. Ec. R.	18 40 38	I. Oc. D.		
1 43 0	II. Tr. E.			18 48 1	II. Sh. E.	19 1 35 56	I. Tr. E.
2 54 40	II. Sh. E.	8 8 20 54	I. Tr. I.	21 17 30	I. Ec. R.	1 56 7	I. Sh. E.
3 37 55	I. Oc. D.	8 52 58	I. Sh. I.			13 35 12	III. Tr. I.
6 25 14	I. Ec. R.	10 32 7	I. Tr. E.	13 15 52 41	I. Tr. I.	15 8 16	III. Sh. I.
		11 2 53	I. Sh. E.	16 19 27	I. Sh. I.	15 35 26	III. Tr. E.
3 0 49 7	I. Tr. I.	18 41 41	III. Oc. D.	18 3 55	I. Tr. E.	16 45 50	III. Sh. E.
1 26 20	I. Sh. I.	20 45 3	III. Oc. R.	18 29 27	I. Sh. E.	18 12 25	II. Tr. I.
3 0 17	I. Tr. E.	20 58 22	III. Ec. D.			18 53 34	II. Sh. I.
3 36 9	I. Sh. E.	22 38 15	III. Ec. R.	14 9 50 47	II. Oc. D.	20 42 33	I. Oc. D.
17 31 21	II. Oc. D.			13 11 7	I. Oc. D.	20 46 8	II. Tr. E.
21 18 54	II. Ec. R.	9 1 57 51	II. Tr. I.	13 16 42	II. Ec. R.	21 23 23	II. Sh. E.
22 8 20	I. Oc. D.	3 0 22	II. Sh. I.	15 46 12	I. Ec. R.	23 12 14	I. Ec. R.
		4 32 5	II. Tr. E.				
4 0 53 56	I. Ec. R.	5 30 17	II. Sh. E.	15 10 23 22	I. Tr. I.	20 17 55 15	I. Tr. I.
19 19 44	I. Tr. I.	5 39 42	I. Oc. D.	10 48 23	I. Sh. I.	18 14 49	I. Sh. I.
19 55 14	I. Sh. I.	8 20 6	I. Ec. R.	12 34 37	I.*Tr. E.	20 6 30	I. Tr. E.
21 30 55	I. Tr. E.			12 58 23	I. Sh. E.	20 24 53	I. Sh. E.
22 5 6	I. Sh. E.	10 2 51 28	I. Tr. I.	23 12 6	III. Oc. D.		
		3 21 47	I. Sh. I.			21 12 43 58	II. Oc. D.
5 4 32 4	III. Tr. I.	5 2 41	I. Tr. E.	16 2 39 16	III. Ec. R.	15 13 2	I. Oc. D.
6 34 8	III. Tr. E.	5 31 43	I. Sh. E.	4 47 30	II. Tr. I.	15 54 54	II. Ec. R.
7 4 31	III. Sh. I.	20 23 55	II. Oc. D.	5 35 50	II. Sh. I.	17 40 55	I. Ec. R.
8 41 40	III. Sh. E.	23 57 10	II. Ec. R.	7 21 24	II. Tr. E.		
12 33 9	II.*Tr. I.			7 41 35	I. Oc. D.	22 12 25 58	I. Tr. I.
13 42 36	II. Sh. I.	11 0 10 9	I. Oc. D.	8 5 42	II. Sh. E.	12 43 43	I. Sh. I.
15 7 32	II. Tr. E.	2 48 47	I. Ec. R.	10 14 52	I. Ec. R.	14 87 13	I. Tr. E.
16 12 31	II. Sh. E.	21 22 8	I. Tr. I.			14 53 48	I. Sh. E.
16 38 48	I. Oc. D.	21 50 41	I. Sh. I.	17 4 53 58	I. Tr. I.		

By reason of the proximity of Jupiter to the Sun the phenomena of the satellites are not given from April 23 to May 31.


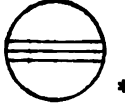
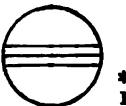

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV. No Eclipse.	

Configurations at 12^h 45^m for an Inverting Telescope.

Day.	West.				East.			
1			1. ○ 3	2. 4				
2		2.	○	1. 3	4			
3		1. 2	○		3.		4	
4			○	1. 3			4	
5	○ 2.		1. ○				4.	
6		3.	2	1 ○		4.		
7		3		○ 2	4.			1 ●
8			1. ○ 4.	2.				
9			4. ○	1. 3				
10		4.	1. ○			3		
11		4.		○ 1. 3				
12		4.	1. 3 ○ 2.					
13		4	3. 2.	○ 1.				
14		4	3	○ 1				2 ●
15		4	3 1 ○	2.				
16			4. 3	○ 1. 3				
17			1. ○	4		3		
18				○ 1. 3				
19			1	○ 2.		4		
20		3. 2.	○ 1.			4		
21		3	1 ○			4.		2 ●
22	○ 1.		3	○ 2.		4.		

GREENWICH MEAN TIME.

JUNE.

d h m s		d h m s		d h m s		d h m s	
1 8 29 21	I. Ec. D.	8 23 11 2	III. Tr. E.	17 10 25 55	II. Ec. D.	26 6 5 47	I. Oc. R.
10 23 29	II. Sh. I.			14 18 53	II. Oc. R.	7 25 17	II. Sh. I.
11 3 8	I. Oc. R.	9 7 40 17	I. Sh. I.			8 59 4	II. Tr. I.
11 10 13	II. Tr. I.	8 11 58	I. Tr. I.	18 4 3 48	I. Sh. I.	9 54 13	II. Sh. E.
12 52 51	II. Sh. E.	9 50 16	I. Sh. E.	4 43 52	I. Tr. I.	11 28 51	II. Tr. E.
13 41 33	II. Tr. E.	10 22 38	I. Tr. E.	6 13 38	I. Sh. E.	17 5 16	III. Ec. D.
15 14 52	III. Sh. I.			6 54 19	I. Tr. E.	18 48 59	III. Ec. R.
16 46 35	III. Tr. I.	10 45 2 2	I. Ec. D.			20 14 50	III.*Oc. D.
16 54 22	III. Sh. E.	7 34 32	I. Oc. R.	19 1 14 35	I. Ec. D.	22 8 52	III. Oc. R.
18 41 10	III. Tr. E.	7 48 28	II. Ec. D.	4 5 25	I. Oc. R.		
		11 28 1	II. Oc. R.	4 50 28	II. Sh. I.	27 0 27 5	I. Sh. I.
2 5 45 26	I. Sh. I.			6 11 27	II. Tr. I.	1 15 3	I. Tr. I.
6 10 8	I. Tr. I.	11 2 9 3	I. Sh. I.	7 19 32	II. Sh. E.	2 36 47	I. Sh. E.
7 55 29	I. Sh. E.	2 42 26	I. Tr. I.	8 41 40	II. Tr. E.	3 25 15	I. Tr. E.
8 20 57	I. Tr. E.	4 18 59	I. Sh. E.	13 5 6	III. Ec. D.	21 37 3	I. Ec. D.
		4 53 4	I. Tr. E.	14 48 15	III. Ec. R.		
3 2 57 55	I. Ec. D.	23 20 33	I. Ec. D.	15 48 6	III. Oc. D.	28 0 35 49	I. Oc. R.
5 10 53	II. Ec. D.			17 42 41	III. Oc. R.	2 21 18	II. Ec. D.
5 33 28	I. Oc. R.	12 2 4 44	I. Oc. R.	22 32 26	I. Sh. I.	6 33 15	II. Oc. R.
8 36 32	II. Oc. R.	2 15 43	II. Sh. I.	23 14 7	I. Tr. I.	18 55 48	I. Sh. I.
		3 23 19	II. Tr. I.			19 45 17	I. Tr. I.
4 0 14 13	I. Sh. I.	4 44 54	II. Sh. E.	20 0 42 15	I. Sh. E.	21 5 28	I.*Sh. E.
0 40 40	I. Tr. I.	5 53 58	II. Tr. E.	1 24 31	I. Tr. E.	21 55 26	I. Tr. E.
2 24 15	I. Sh. E.	9 4 16	III. Ec. D.	19 43 5	I. Ec. D.		
2 51 28	I. Tr. E.	10 46 56	III. Ec. R.	22 35 33	I. Oc. R.	29 16 5 31	I. Ec. D.
21 26 26	I. Ec. D.	11 19 23	III. Oc. D.	23 44 8	II. Ec. D.	19 5 48	I. Oc. R.
23 40 54	II. Sh. I.	13 14 38	III. Oc. R.			20 42 39	II.*Sh. I.
		20 37 42	I. Sh. I.	21 3 43 38	II. Oc. R.	22 22 36	II. Tr. I.
5 0 3 45	I. Oc. R.	21 12 47	I. Tr. I.	17 1 10	I. Sh. I.	23 11 33	II. Sh. E.
0 34 41	II. Tr. I.	22 47 37	I. Sh. E.	17 44 28	I. Tr. I.		
2 10 13	II. Sh. E.	23 23 22	I. Tr. E.	19 10 58	I. Sh. E.	30 0 52 12	II. Tr. E.
3 5 47	II. Tr. E.			19 54 49	I. Tr. E.	7 17 9	III. Sh. I.
5 4 1	III. Ec. D.	13 17 49 3	I. Ec. D.			8 58 42	III. Sh. E.
6 46 12	III. Ec. R.	20 34 56	I. Oc. R.	23 14 11 34	I. Ec. D.	10 39 54	III. Tr. I.
6 50 15	III. Oc. D.	21 6 46	II.*Ec. D.	17 5 38	I. Oc. R.	12 31 40	III. Tr. E.
8 46 11	III. Oc. R.			18 7 51	II. Sh. I.	13 24 22	I. Sh. I.
18 42 53	I. Sh. I.	14 0 53 8	II. Oc. R.	19 35 18	II. Tr. I.	14 15 21	I. Tr. I.
19 11 6	I. Tr. I.	15 6 27	I. Sh. I.	20 36 51	II.*Sh. E.	15 34 1	I. Sh. E.
20 52 54	I. Sh. E.	15 43 13	I. Tr. I.	22 5 19	II. Tr. E.	16 25 26	I. Tr. E.
21 21 51	I. Tr. E.	17 16 21	I. Sh. E.				
		17 53 45	I. Tr. E.	23 3 16 58	III. Sh. I.		
6 15 54 58	I. Ec. D.			4 58 0	III. Sh. E.		
18 29 15	II. Ec. D.	15 12 17 34	I. Ec. D.	6 13 47	III. Tr. I.		
18 34 1	I. Oc. R.	15 5 6	I. Oc. R.	8 6 13	III. Tr. E.		
22 1 56	II. Oc. R.	15 33 5	II. Sh. I.	11 29 46	I. Sh. I.		
		16 47 25	II. Tr. I.	12 14 39	I. Tr. I.		
7 13 11 39	I. Sh. I.	18 2 12	II. Sh. E.	13 39 32	I. Sh. E.		
13 41 36	I. Tr. I.	19 17 53	II. Tr. E.	14 24 56	I. Tr. E.		
15 21 39	I. Sh. E.	23 16 41	III. Sh. I.				
15 52 19	I. Tr. E.			24 8 40 5	I. Ec. D.		
		16 0 57 11	III. Sh. E.	11 35 45	I. Oc. R.		
8 10 23 30	I. Ec. D.	1 46 13	III. Tr. I.	13 3 9	II. Ec. D.		
12 58 19	II. Sh. I.	3 39 20	III. Tr. E.	17 8 55	II. Oc. R.		
13 4 16	I. Oc. R.	9 35 4	I. Sh. I.				
13 59 2	II. Tr. I.	10 13 30	I. Tr. I.	25 5 58 28	I. Sh. I.		
15 27 33	II. Sh. E.	11 44 57	I. Sh. E.	6 44 54	I. Tr. I.		
16 29 56	II. Tr. E.	12 23 59	I. Tr. E.	8 8 12	I. Sh. E.		
19 16 6	III. Sh. I.			8 55 9	I. Tr. E.		
20 56 6	III. Sh. E.	17 6 46 5	I. Ec. D.				
21 17 12	III. Tr. I.	9 35 18	I. Oc. R.	26 3 8 34	I. Ec. D.		

NOTE.—I. denotes Ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

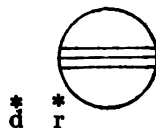
JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

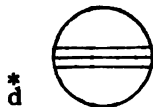
I.



III.



II.



IV. No Eclipse.



Configurations at 20^h 45^m for an Inverting Telescope.

Day.	West.	East.
1	4.	2. 3. ○ 1.
2	4.	3. 1. ○
3	4.	3. ○ 1. 2
4	4.	3. ○ 12.
5	○ 1.	4. ○ 3
6		○ 1. 3. 2 ●
7		1. ○ 4 3.
8		2. ○ 1. 4
9	3. 2. 1	○ 4
10	3.	○ 1. 2 4
11	3. 1	○ 2. 4.
12	2.	1 ○ 3 4.
13		○ 1. 4 3.
14		1. ○ 4. 2 3.
15		4. 2. ○ 3. 1.
16	4. 3. 21.	○
17	4. 3.	○ 1. 2
18	4. 3. 1	○ 2.
19	4. 2.	○ 1. 3
20	4.	2. ○ 3. 1 ●
21	4.	1. ○ 2. 3.
22	○ 2.	4. ○ 1. 3.
23		3. 1. ○
24	3.	○ 2. 1. 4
25	3. 1	○ 2. 4
26	2.	○ 1. 4. 3 ●
27	2. 1	○ 3. 4
28	○ 1.	○ 2. 3. 4.
29		○ 1. 3. 4.
30	2. 1.	○ 4.

GREENWICH MEAN TIME.

JULY.

d h m s		d h m s		d h m s		d h m s	
11 034 1	I. Ec. D.	10 10 518	I. Oc. R.	18 9 23 46	III. Oc. D.	27 4 42 37	I. Sh. E.
13 35 49	I. Oc. R.	12 34 56	II. Sh. I.	9 24 25	I. Tr. E.	5 52 33	I. Tr. E.
15 40 13	II. Ec. D.	14 32 13	II. Tr. I.	11 16 30	III. Oc. R.	23 40 53	I. Ec. D.
19 58 2	II.*Oc. R.	15 3 39	II. Sh. E.				
		17 1 9	II. Tr. E.	19 3 18 39	I. Ec. D.	28 3 154	I. Oc. R.
2 7 53 4	I. Sh. I.			6 34 3	I. Oc. R.	7 2 19	II. Sh. I.
8 45 29	I. Tr. I.	11 1 4 58	III. Ec. D.	10 11 47	II. Ec. D.	9 23 55	II. Tr. I.
10 2 40	I. Sh. E.	2 50 1	III. Ec. R.	14 55 49	II. Oc. R.	9 30 49	II. Sh. E.
10 55 31	I. Tr. E.	4 16 8	I. Sh. I.			11 51 52	II. Tr. E.
		5 2 58	III. Oc. D.	20 0 39 11	I. Sh. I.	21 1 58	I.*Sh. I.
3 5 2 29	I. Ec. D.	5 15 28	I. Tr. I.	1 44 40	I. Tr. I.	22 12 44	I. Tr. I.
8 5 45	I. Oc. R.	6 25 35	I. Sh. E.	2 48 27	I. Sh. E.	23 11 5	I. Sh. E.
10 0 5	II. Sh. I.	6 56 6	III. Oc. R.	3 54 11	I. Tr. E.	23 18 26	III. Sh. I.
11 46 0	II. Tr. I.	7 25 15	I. Tr. E.	21 47 5	I. Ec. D.		
12 28 55	II. Sh. E.					29 0 21 59	I. Tr. E.
14 15 22	II. Tr. E.	12 124 50	I. Ec. D.	21 1 3 40	I. Oc. R.	1 2 35	III. Sh. E.
21 5 29	III.*Ec. D.	4 35 7	I. Oc. R.	4 27 18	II. Sh. I.	4 6 11	III. Tr. I.
22 49 51	III. Ec. R.	7 35 9	II. Ec. D.	6 39 59	II. Tr. I.	5 55 53	III. Tr. E.
		12 9 28	II. Oc. R.	6 55 53	II. Sh. E.	18 9 21	I. Ec. D.
4 0 40 6	III. Oc. D.	22 44 49	I. Sh. I.	9 8 19	II. Tr. E.	21 31 24	I.*Oc. R.
2 21 39	I. Sh. I.	23 45 26	I. Tr. I.	19 7 42	I.*Sh. I.		
2 33 40	III. Oc. R.			19 18 1	III.*Sh. I.	30 2 6 37	II. Ec. D.
3 15 31	I. Tr. I.	13 0 54 13	I. Sh. E.	20 14 19	I.*Tr. I.	7 2 56	II. Oc. R.
4 31 14	I. Sh. E.	1 55 9	I. Tr. E.	21 1 25	III.*Sh. E.	15 30 33	I. Sh. I.
5 25 30	I. Tr. E.	19 53 16	I.*Ec. D.	21 16 56	I.*Sh. E.	16 42 15	I. Tr. I.
23 30 57	I. Ec. D.	23 4 52	I. Oc. R.	22 23 46	I. Tr. E.	17 39 38	I. Sh. E.
				23 47 53	III. Tr. I.	18 51 27	I.*Tr. E.
5 2 35 41	I. Oc. R.	14 1 52 23	II. Sh. I.				
4 58 20	II. Ec. D.	3 55 3	II. Tr. I.	22 1 38 2	III. Tr. E.	31 12 37 47	I. Ec. D.
9 21 55	II. Oc. R.	4 21 3	II. Sh. E.	16 15 34	I. Ec. D.	16 0 48	I. Oc. R.
20 50 21	I.*Sh. I.	6 23 48	II. Tr. E.	19 33 20	I.*Oc. R.	20 19 47	II.*Sh. I.
21 45 37	I. Tr. I.	15 17 53	III. Sh. I.	23 30 19	II. Ec. D.	22 45 12	II. Tr. I.
22 59 53	I. Sh. E.	17 0 36	III. Sh. E.			22 48 16	II. Sh. E.
23 55 33	I. Tr. E.	17 13 21	I. Sh. I.	23 4 18 43	II. Oc. R.		
		18 15 14	I. Tr. I.	13 36 19	I. Sh. I.		
6 17 59 25	I. Ec. D.	19 22 43	I.*Sh. E.	14 44 1	I. Tr. I.		
21 5 34	I.*Oc. R.	19 27 24	III.*Tr. I.	15 45 31	I. Sh. E.		
23 17 29	II. Sh. I.	20 24 54	I.*Tr. E.	16 53 25	I. Tr. E.		
		21 18 3	III.*Tr. E.				
7 1 9 11	II. Tr. I.			24 10 44 0	I. Ec. D.		
1 46 15	II. Sh. E.	15 14 21 46	I. Ec. D.	14 2 53	I. Oc. R.		
3 38 22	II. Tr. E.	17 34 40	I. Oc. R.	17 44 45	II. Sh. I.		
11 17 14	III. Sh. I.	20 53 48	II.*Ec. D.	20 2 0	II.*Tr. I.		
12 59 21	III. Sh. E.			20 13 18	II.*Sh. E.		
15 4 17	III. Tr. I.	16 1 33 3	II. Oc. R.	22 30 9	II. Tr. E.		
15 18 54	I. Sh. I.	11 41 59	I. Sh. I.				
16 15 34	I. Tr. I.	12 45 6	I. Tr. I.	25 8 4 51	I. Sh. I.		
16 55 28	III. Tr. E.	13 51 19	I. Sh. E.	9 3 52	III. Ec. D.		
17 28 25	I. Sh. E.	14 54 43	I. Tr. E.	9 13 37	I. Tr. I.		
18 25 27	I. Tr. E.			10 14 1	I. Sh. E.		
		17 8 50 12	I. Ec. D.	10 50 19	III. Ec. R.		
8 12 27 55	I. Ec. D.	12 4 22	I. Oc. R.	11 22 57	I. Tr. E.		
15 35 28	I. Oc. R.	15 9 49	II. Sh. I.	13 42 40	III. Oc. D.		
18 17 6	II. Ec. D.	17 17 36	II. Tr. I.	15 34 58	III. Oc. R.		
22 46 8	II. Oc. R.	17 38 26	II. Sh. E.				
		19 46 8	II.*Tr. E.	26 5 12 28	I. Ec. D.		
9 9 47 34	I. Sh. I.			8 32 26	I. Oc. R.		
10 45 34	I. Tr. I.	18 5 4 19	III. Ec. D.	12 48 13	II. Ec. D.		
11 57 2	I. Sh. E.	6 10 32	I. Sh. I.	17 40 47	II. Oc. R.		
12 55 23	I. Tr. E.	6 50 4	III. Ec. R.				
		7 14 51	I. Tr. I.	27 2 33 28	I. Sh. I.		
10 6 56 22	I. Ec. D.	8 19 51	I. Sh. E.	3 43 15	I. Tr. I.		

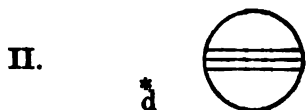
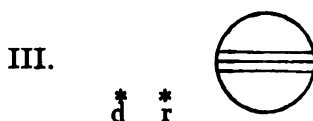
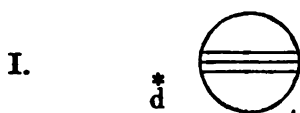
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 20^h 15^m for an Inverting Telescope.

Day.	West.	East.
1	3.	○ 24. 1
2	.3 4.	○ 2.
3	4. 2. 3	○ 1.
4	4. 2. 1	○ .3
5	4.	○ 1. 2. 3
6	.4	○ 2. 3. 1 ●
7	.4 2. 5.	○ 1.
8	.4 3.	○ .1 2 ●
9	.3 4.	○ 2.
10	.3	○ .4 1.
11	.2 .1	○ .3 .4
12		○ 1. 2. 3. 4
13		○ 2. 3. 4. 1 ●
14	○ 3. ○ 1.	2. ○ .4
15	3.	.2 ○ .1 4.
16	.3 1.	○ .2 4.
17	.3 2.	○ .1 4.
18	.2 .1	○ 4. 3
19	4.	○ 1. 3
20	4. 1	○ 2. 3.
21	○ 1. 4.	2. ○ 3.
22	4. 3.	.2 ○ .1
23	.4 .3 1.	○ .2
24	○ 2. .4 .3	○ .1
25	.4 .2 1.	○ .3
26	.4	○ .2 1. 3
27	.1	○ .4 2. 3.
28	2.	○ 1. 3. 4
29	3. .2	○ .4 1 ●
30	3. 1.	○ .2 .4
31	.3	○ 2. .1 4.

GREENWICH MEAN TIME.

AUGUST.

d h m s		d h m s		d h m s		d h m s	
1 113 8	II. Tr. E.	8 22 13 38	III. Oc. D.	16 20 36 21	II.*Ec. D.	24 10 9 41	I. Sh. I.
9 59 4	I. Sh. I.			23 6 50	II. Ec. R.	11 29 54	I. Tr. I.
11 11 40	I. Tr. I.	9 0 5 4	III. Oc. R.	23 17 40	II. Oc. D.	12 18 27	I. Sh. E.
12 8 6	I. Sh. E.	9 0 0	I. Ec. D.			13 38 30	I. Tr. E.
13 3 35	III. Ec. D.	12 27 17	I. Oc. R.	17 1 46 23	II. Oc. R.		
13 20 49	I. Tr. E.	18 0 30	II.*Ec. D.	8 15 46	I. Sh. I.	25 7 15 55	I. Ec. D.
14 50 46	III. Ec. R.	20 31 5	II.*Ec. R.	9 34 31	I. Tr. I.	10 47 50	I. Oc. R.
17 59 13	III. Oc. D.	20 37 5	II.*Oc. D.	10 24 35	I. Sh. E.	17 23 7	II.*Sh. I.
19 51 5	III.*Oc. R.	23 6 13	II. Oc. R.	11 43 16	I. Tr. E.	19 51 37	II.*Sh. E.
						20 6 49	II.*Tr. I.
2 7 6 14	I. Ec. D.	10 6 21 45	I. Sh. I.	18 5 22 9	I. Ec. D.	22 33 31	II. Tr. E.
10 30 12	I. Oc. R.	7 38 14	I. Tr. I.	8 52 32	I. Oc. R.		
15 24 27	II. Ec. D.	8 30 40	I. Sh. E.	14 47 47	II. Sh. I.	26 4 38 6	I. Sh. I.
20 24 17	II.*Oc. R.	9 47 9	I. Tr. E.	17 16 14	II.*Sh. E.	5 58 32	I. Tr. I.
				17 28 20	II.*Tr. I.	6 46 52	I. Sh. E.
3 4 27 39	I. Sh. I.	11 3 28 24	I. Ec. D.	19 55 17	II.*Tr. E.	8 7 8	I. Tr. E.
5 41 7	I. Tr. I.	6 56 24	I. Oc. R.			15 16 36	III. Sh. I.
6 36 41	I. Sh. E.	12 12 32	II. Sh. I.	19 2 44 11	I. Sh. I.	17 4 2	III.*Sh. E.
7 50 13	I. Tr. E.	14 40 58	II. Sh. E.	4 3 23	I. Tr. I.	20 47 17	III.*Tr. I.
		14 48 12	II. Tr. I.	4 53 1	I. Sh. E.	22 34 52	III. Tr. E.
4 1 34 39	I. Ec. D.	17 15 28	II. Tr. E.	6 12 7	I. Tr. E.		
4 59 30	I. Oc. R.			11 17 13	III. Sh. I.	27 1 44 25	I. Ec. D.
9 37 22	II. Sh. I.	12 0 50 12	I. Sh. I.	13 3 45	III. Sh. E.	5 16 34	I. Oc. R.
12 5 50	II. Sh. E.	2 7 20	I. Tr. I.	16 42 5	III. Tr. I.	12 29 56	II. Ec. D.
12 6 41	II. Tr. I.	2 59 6	I. Sh. E.	18 30 16	III.*Tr. E.	15 0 16	II. Ec. R.
14 34 17	II. Tr. E.	4 16 12	I. Tr. E.	23 50 39	I. Ec. D.	15 15 4	II. Oc. D.
22 56 8	I. Sh. I.	7 17 45	III. Sh. I.			17 43 12	II.*Oc. R.
		9 3 28	III. Sh. E.	20 3 21 29	I. Oc. R.	23 6 35	I. Sh. I.
5 0 10 25	I. Tr. I.	12 33 16	III. Tr. I.	9 54 23	II. Ec. D.		
1 5 8	I. Sh. E.	14 22 0	III. Tr. E.	12 24 48	II. Ec. R.	28 0 27 12	I. Tr. I.
2 19 29	I. Tr. E.	21 56 53	I. Ec. D.	12 37 22	II. Oc. D.	1 15 21	I. Sh. E.
3 18 14	III. Sh. I.			15 5 53	II. Oc. R.	2 35 45	I. Tr. E.
5 3 8	III. Sh. E.	13 1 25 33	I. Oc. R.	21 12 42	I.*Sh. I.	20 12 50	I.*Ec. D.
8 21 18	III. Tr. I.	7 18 40	II. Ec. D.	22 32 18	I. Tr. I.	23 45 10	I. Oc. R.
10 10 31	III. Tr. E.	9 49 10	II. Ec. R.	23 21 31	I. Sh. E.		
20 3 8	I.*Ec. D.	9 57 45	II. Oc. D.			29 6 40 42	II. Sh. I.
23 28 50	I. Oc. R.	12 26 40	II. Oc. R.	21 0 40 59	I. Tr. E.	9 9 13	II. Sh. E.
		19 18 45	I.*Sh. I.	18 19 4	I.*Ec. D.	9 25 15	II. Tr. I.
6 4 42 45	II. Ec. D.	20 36 27	I.*Tr. I.	21 50 19	I.*Oc. R.	11 51 49	II. Tr. E.
7 13 22	II. Ec. R.	21 27 37	I.*Sh. E.			17 35 1	I.*Sh. I.
7 16 18	II. Oc. D.	22 45 18	I. Tr. E.	22 4 5 20	II. Sh. I.	18 55 45	I.*Tr. I.
9 45 38	II. Oc. R.			6 33 47	II. Sh. E.	19 43 46	I.*Sh. E.
17 24 42	I. Sh. I.	14 16 25 18	I. Ec. D.	6 47 37	II. Tr. I.	21 4 16	I.*Tr. E.
18 39 45	I.*Tr. I.	19 54 35	I.*Oc. R.	9 14 25	II. Tr. E.		
19 33 40	I.*Sh. E.			15 41 9	I. Sh. I.	30 5 2 26	III. Ec. D.
20 48 45	I.*Tr. E.	15 1 30 4	II. Sh. I.	17 1 5	I.*Tr. I.	6 53 1	III. Ec. R.
		3 58 29	II. Sh. E.	17 49 57	I.*Sh. E.	10 34 37	III. Oc. D.
7 14 31 33	I. Ec. D.	4 8 19	II. Tr. I.	19 9 43	I.*Tr. E.	12 24 34	III. Oc. R.
17 58 3	I.*Oc. R.	6 35 25	II. Tr. E.			14 41 18	I. Ec. D.
22 54 52	II. Sh. I.	13 47 12	I. Sh. I.	23 1 3 20	III. Ec. D.	18 13 46	I.*Oc. R.
		15 5 28	I. Tr. I.	2 53 1	III. Ec. R.		
8 1 23 18	II. Sh. E.	15 56 4	I. Sh. E.	6 31 35	III. Oc. D.	31 1 47 31	II. Ec. D.
1 27 30	II. Tr. I.	17 14 15	I. Tr. E.	8 22 6	III. Oc. R.	4 17 49	II. Ec. R.
3 54 55	II. Tr. E.	21 3 35	III.*Ec. D.	12 47 31	I. Ec. D.	4 33 3	II. Oc. D.
11 53 11	I. Sh. I.	22 52 23	III. Ec. R.	16 19 8	I. Oc. R.	7 1 1	II. Oc. R.
13 8 58	I. Tr. I.			23 12 3	II. Ec. D.	12 3 32	I. Sh. I.
14 2 7	I. Sh. E.	16 2 24 16	III. Oc. D.			13 24 19	I. Tr. I.
15 17 56	I. Tr. E.	4 15 20	III. Oc. R.	24 1 42 26	II. Ec. R.	14 12 16	I. Sh. E.
17 3 54	III. Ec. D.	10 53 45	I. Ec. D.	1 56 23	II. Oc. D.	15 32 48	I. Tr. E.
18 51 52	III.*Ec. R.	14 23 37	I. Oc. R.	4 24 43	II. Oc. R.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

Configurations at 19^h 30^m for an Inverting Telescope.

Day.	West.	East.
1	2. 1. ○	4. .3 ●
2	○	.1 .3 4. .2 ●
3	.1 ○	2.4. 3.
4	2. ○ 1. 3.	
5	4. 4. 5. .1 ○	
6	○ 1. 4. 3. ○	.2
7	4. .3 ○	.12.
8	4. 2. 1. . ○ 3	
9	.4 ○	.1 .3 .2 ●
10	.4 .1 ○	2. 3.
11	.4 2. ○ 1. 3.	
12	.2 4. 1. ○	
13	3. 1 ○ . 4.	
14	.3 ○	2. .4 .1 ●
15	2. 1. ○	.4
16	.2 ○	.1 .3 .4
17	1. ○	.2 .3 4.
18	○ 2. 1. 3. 4.	
19	.2 .13. ○	4.
20	3. ○	1.2 4.
21	.3 ○	2. .1 ●
22	4. 2.3 1. ○	
23	4. .2 ○	.1 .3
24	4. 1. ○	.2 .3
25	4. 2 ○ .	.1 3.
26	.4 .2 .1 3 ○ .	
27	.4 3. ○	.21.
28	.3 .4 .1 ○	2.
29	○ 1. .32. .4 ○	
30	.2 ○	.1 .3 .4
31	1. ○	.2 .3 .4

GREENWICH MEAN TIME.

SEPTEMBER.

d h m s		d h m s		d h m s		d h m s	
1 9 9 42	I. Ec. D.	9 8 25 41	I. Sh. I.	17 7 25 52	I. Ec. D.	25 1 24 2	II. Oc. D.
12 42 14	I. Oc. R.	9 45 53	I. Tr. I.	8 39 52	III. Tr. I.	3 50 47	II. Oc. R.
19 58 36	II.*Sh. I.	10 34 26	I. Sh. E.	10 25 30	III. Tr. E.	6 41 24	I. Sh. I.
22 27 10	II. Sh. E.	11 54 17	I. Tr. E.	10 56 5	I. Oc. R.	7 56 25	I. Tr. I.
22 43 39	II. Tr. I.	23 16 4	III. Sh. I.	20 15 37	II.*Ec. D.	8 50 20	I. Sh. E.
				22 45 42	II. Ec. R.	10 4 48	I. Tr. E.
				22 55 16	II. Oc. D.		
2 1 10 7	II. Tr. E.	10 1 5 26	III. Sh. E.			26 3 48 14	I. Ec. D.
6 31 56	I. Sh. I.	4 46 39	III. Tr. I.			7 14 42	I. Oc. R.
7 52 44	I. Tr. I.	5 32 1	I. Ec. D.	18 1 22 20	II. Oc. R.	17 3 23	II.*Sh. I.
8 40 40	I. Sh. E.	6 32 57	III. Tr. E.	4 47 47	I. Sh. I.	19 32 35	II.*Sh. E.
10 1 12	I. Tr. E.	9 3 56	I. Oc. R.	6 5 47	I. Tr. I.	19 36 30	II.*Tr. I.
19 16 35	III.*Sh. I.	17 40 33	II.*Ec. D.	6 56 37	I. Sh. E.	22 2 30	II.*Tr. E.
21 4 56	III.*Sh. E.	20 10 42	II.*Ec. R.	8 14 8	I. Tr. E.		
		20 24 7	II.*Oc. D.				
3 0 49 17	III. Tr. I.	22 51 31	II. Oc. R.	19 1 54 19	I. Ec. D.	27 1 9 47	I. Sh. I.
2 36 14	III. Tr. E.			5 23 55	I. Oc. R.	2 23 52	I. Tr. I.
3 38 12	I. Ec. D.	11 2 54 7	I. Sh. I.	14 27 31	II. Sh. I.	3 18 45	I. Sh. E.
7 10 45	I. Oc. R.	4 14 0	I. Tr. I.	16 56 29	II.*Sh. E.	4 32 15	I. Tr. E.
15 5 18	II. Ec. D.	5 2 53	I. Sh. E.	17 6 53	II.*Tr. I.	21 0 32	III.*Ec. D.
17 35 32	II.*Ec. R.	6 22 24	I. Tr. E.	19 32 57	II.*Tr. E.	22 16 46	I.*Ec. D.
17 50 40	II.*Oc. D.			23 16 10	I. Sh. I.	22 54 57	III. Ec. R.
20 18 26	II.*Oc. R.	12 0 0 27	I. Ec. D.				
		3 32 2	I. Oc. R.	20 0 33 31	I. Tr. I.	28 1 42 15	I. Oc. R.
4 1 0 23	I. Sh. I.	11 51 46	II. Sh. I.	1 25 2	I. Sh. E.	2 6 33	III. Oc. D.
2 21 7	I. Tr. I.	14 20 32	II. Sh. E.	2 41 53	I. Tr. E.	3 53 29	III. Oc. R.
3 9 8	I. Sh. E.	14 35 1	II. Tr. I.	17 0 18	III.*Ec. D.	12 7 57	II. Ec. D.
4 29 35	I. Tr. E.	17 1 12	II.*Tr. E.	18 53 43	III.*Ec. R.	17 4 8	II.*Oc. R.
22 6 37	I.*Ec. D.	21 22 31	I.*Sh. I.	20 22 49	I.*Ec. D.	19 38 13	I.*Sh. I.
		22 42 2	I. Tr. I.	22 19 44	III.*Oc. D.	20 51 19	I.*Tr. I.
5 1 39 6	I. Oc. R.	23 31 18	I. Sh. E.	23 51 45	I. Oc. R.	21 47 13	I.*Sh. E.
9 16 11	II. Sh. I.					22 59 42	I. Tr. E.
11 44 48	II. Sh. E.	13 0 50 24	I. Tr. E.	21 0 7 31	III. Oc. R.		
12 1 7	II. Tr. I.	13 0 46	III. Ec. D.	9 33 2	II. Ec. D.	29 16 45 11	I.*Ec. D.
14 27 28	II. Tr. E.	14 53 13	III. Ec. R.	12 3 6	II. Ec. R.	20 9 38	I.*Oc. R.
19 28 48	I.*Sh. I.	18 28 53	III.*Oc. D.	12 9 54	II. Oc. D.		
20 49 25	I.*Tr. I.	18 28 56	I.*Ec. D.	14 36 50	II. Oc. R.	30 6 21 39	II. Sh. I.
21 37 33	I.*Sh. E.	20 17 28	III.*Oc. R.	17 44 37	I.*Sh. I.	8 50 48	II. Tr. I.
22 57 51	I. Tr. E.	22 0 9	I.*Oc. R.	19 1 15	I.*Tr. I.	8 51 0	II. Sh. E.
				19 53 30	I.*Sh. E.	11 16 49	II. Tr. E.
6 9 1 27	III. Ec. D.	14 6 58 0	II. Ec. D.	21 9 37	I.*Tr. E.	14 6 36	I. Sh. I.
10 52 58	III. Ec. R.	9 28 9	II. Ec. R.			15 18 38	I.*Tr. I.
14 33 40	III. Oc. D.	9 39 57	II. Oc. D.	23 14 51 14	I. Ec. D.	16 15 38	I.*Sh. E.
16 22 59	III.*Oc. R.	12 7 11	II. Oc. R.	18 19 25	I.*Oc. R.	17 27 2	I.*Tr. E.
16 35 6	I.*Ec. D.	15 50 59	I.*Sh. I.				
20 7 28	I.*Oc. R.	17 10 3	I.*Tr. I.	23 3 45 41	II. Sh. I.		
		17 59 46	I.*Sh. E.	6 14 46	II. Sh. E.		
7 4 22 51	II. Ec. D.	19 18 26	I.*Tr. E.	6 22 16	II. Tr. I.		
6 53 3	II. Ec. R.			8 48 19	II. Tr. E.		
7 7 37	II. Oc. D.	15 12 57 20	I. Ec. D.	12 12 59	I. Sh. I.		
9 35 13	II. Oc. R.	16 28 5	I.*Oc. R.	13 28 51	I. Tr. I.		
13 57 18	I. Sh. I.			14 21 54	I. Sh. E.		
15 17 43	I. Tr. I.	16 1 9 52	II. Sh. I.	15 37 13	I.*Tr. E.		
16 6 2	I.*Sh. E.	3 38 44	II. Sh. E.				
17 26 8	I.*Tr. E.	3 51 30	II. Tr. I.	24 7 15 5	III. Sh. I.		
		6 17 38	II. Tr. E.	9 6 39	III. Sh. E.		
8 11 3 30	I. Ec. D.	10 19 21	I. Sh. I.	9 19 47	I. Ec. D.		
14 35 40	I. Oc. R.	11 37 56	I. Tr. I.	12 27 57	III. Tr. I.		
22 34 10	II. Sh. I.	12 28 10	I. Sh. E.	12 47 9	I. Oc. R.		
		13 46 18	I. Tr. E.	14 12 52	III. Tr. E.		
9 1 2 51	II. Sh. E.			22 50 34	II. Ec. D.		
1 18 35	II. Tr. I.	17 3 15 50	III. Sh. I.				
3 44 51	II. Tr. E.	5 6 18	III. Sh. E.	25 1 20 35	II. Ec. R.		

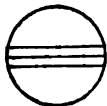
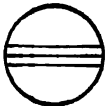


NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
	[*] _d		[*] _d [*] _r
II.		IV. No Eclipse.	
	[*] _d [*] _r		

Configurations at 19^h 0^m for an Inverting Telescope.

Day.	West.				East.			
1					○ 2. 1	3.	4.	
2			2. 1.		○ 3.		4.	
3			3.		○ 1.		4.	2 ●
4			3.	1.	○ 2.		4.	
5			3.	2.	○ 1.		4.	
6			2.		○ 3.	4.		1 ●
7				4.	○ 1.	2.	3.	
8			4.		○ 1.	2.	3.	
9		4.	2.	1.	○ 3.			
10	4.		3.		○ 1.			2 ●
11	4.	3.	1.		○ 2.			
12	4.	3.	2.	1.	○ 1.			
13	4.	2.			○			1 ● 3 ●
14	○ 1.	4.			○ 2.	3.		
15					○ 1.	2.	3.	
16			2.	1.	○ 3.	4.		
17			3.	2.	○ 1.		4.	
18		3.	1.		○ 2.		4.	
19	○ 2.	3.			○ 1.		4.	
20		2.	1.		○ 4.			
21			1.	2.	3.	4.		
22				1.	2.	4. 3.		
23			2.	1.	○ 4.	3.		
24			4.	3.	○ 1.			
25		4. 3.	1.		○ 2.			
26	4.	3.	2.	1.	○ 1.			
27	4.		2.	1.	○			
28	4.				○ 1.	3.		
29	4.				○ 2.	3.		1 ●
30		4.	2.	1.	○ 3.			

GREENWICH MEAN TIME.

OCTOBER.

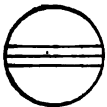
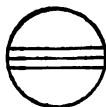
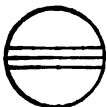
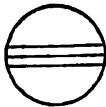
d h m s		d h m s		d h m s		d h m s	
11 13 45	I. Ec. D.	9 11 34 15	I. Tr. I.	18 5 17 58	II. Tr. E.	26 16 22 2	III.*Oc. D.
11 14 6	III. Sh. I.	12 37 49	I. Sh. E.	6 50 34	I. Sh. I.	18 6 12	III.*Oc. R.
13 6 51	III. Sh. E.	13 42 44	I. Tr. E.	7 48 3	I. Tr. I.	22 26 48	II.*Ec. D.
14 37 5	I.*Oc. R.			9 0 2	I. Sh. E.		
16 11 9	III.*Tr. I.	10 7 36 17	I. Ec. D.	9 56 40	I. Tr. E.	27 2 29 51	II. Oc. R.
17 55 19	III.*Tr. E.	10 52 53	I. Oc. R.			3 12 41	I. Sh. I.
		22 15 36	II.*Sh. I.	19 3 59 3	I. Ec. D.	4 0 17	I. Tr. I.
2 1 25 23	II. Ec. D.			7 7 4	I. Oc. R.	5 22 23	I. Sh. E.
6 16 52	II. Oc. R.	11 0 28 58	II. Tr. I.	8 59 10	III. Ec. D.	6 9 2	I. Tr. E.
8 35 0	I. Sh. I.	0 45 22	II. Sh. E.	10 56 49	III. Ec. R.		
9 45 54	I. Tr. I.	2 55 2	II. Tr. E.	12 55 24	III. Oc. D.	28 0 21 51	I. Ec. D.
10 44 4	I. Sh. E.	4 56 57	I. Sh. I.	14 40 9	III.*Oc. R.	3 19 34	I. Oc. R.
11 54 20	I. Tr. E.	6 1 8	I. Tr. I.	19 52 10	II.*Ec. D.	16 47 18	II.*Sh. I.
		7 6 14	I. Sh. E.			18 22 26	II.*Tr. I.
3 5 42 13	I. Ec. D.	8 9 38	I. Tr. E.	20 0 11 45	II. Oc. R.	19 17 54	II.*Sh. E.
9 4 21	I. Oc. R.			1 19 1	I. Sh. I.	20 48 55	II.*Tr. E.
19 39 25	II.*Sh. I.	13 2 4 52	I. Ec. D.	2 14 39	I. Tr. I.	21 41 6	I.*Sh. I.
22 3 54	II.*Tr. I.	4 59 57	III. Ec. D.	3 28 31	I. Sh. E.	22 26 33	I.*Tr. I.
22 8 54	II.*Sh. E.	5 19 54	I. Oc. R.	4 23 17	I. Tr. E.	23 50 51	I. Sh. E.
		6 56 30	III. Ec. R.	22 27 32	I.*Ec. D.		
4 0 29 54	II. Tr. E.	9 24 19	III. Oc. D.			29 0 35 20	I. Tr. E.
3 3 22	I. Sh. I.	11 9 40	III. Oc. R.	31 1 33 38	I. Oc. R.	18 50 31	I.*Ec. D.
4 13 5	I. Tr. I.	17 17 30	II.*Ec. D.	14 10 36	II.*Sh. I.	21 45 58	I.*Oc. R.
5 12 29	I. Sh. E.	21 51 32	II.*Oc. R.	16 2 47	II.*Tr. I.		
6 21 30	I. Tr. E.	23 25 24	I. Sh. I.	16 40 53	II.*Sh. E.	30 3 11 30	III. Sh. I.
				18 29 3	II.*Tr. E.	5 9 12	III. Sh. E.
5 0 10 46	I. Ec. D.	13 0 28 0	I. Tr. I.	19 47 25	I.*Sh. I.	6 17 17	III. Tr. I.
1 0 10	III. Ec. D.	1 34 43	I. Sh. E.	20 41 9	I.*Tr. I.	7 59 18	III. Tr. E.
2 55 38	III. Ec. R.	2 36 31	I. Tr. E.	21 56 58	I.*Sh. E.	11 44 6	II. Ec. D.
3 31 38	I. Oc. R.	20 33 20	I.*Ec. D.	22 49 48	I.*Tr. E.	15 38 10	II.*Oc. R.
5 47 52	III. Oc. D.	23 46 43	I. Oc. R.			16 9 32	I.*Sh. I.
7 33 58	III. Oc. R.			23 16 56 10	I.*Ec. D.	16 52 45	I.*Tr. I.
14 42 45	II.*Ec. D.	14 11 34 5	II. Sh. I.	20 0 16	I.*Oc. R.	18 19 20	I.*Sh. E.
19 29 0	II.*Oc. R.	13 41 2	II.*Tr. I.	23 12 5	III. Sh. I.	19 1 34	I.*Tr. E.
21 31 48	I.*Sh. I.	14 4 2	II.*Sh. E.				
22 40 14	I. Tr. I.	16 7 9	II.*Tr. E.	23 1 8 30	III. Sh. E.	31 13 19 5	I.*Ec. D.
23 40 57	I. Sh. E.	17 53 47	I.*Sh. I.	2 52 38	III. Tr. I.	16 12 13	I.*Oc. R.
		18 54 45	I.*Tr. I.	4 34 54	III. Tr. E.		
6 0 48 40	I. Tr. E.	20 3 9	I.*Sh. E.	9 9 27	II. Ec. D.		
18 39 13	I.*Ec. D.	21 3 18	I.*Tr. E.	13 21 1	II.*Oc. R.		
21 58 44	I.*Oc. R.			14 15 49	I.*Sh. I.		
		15 15 1 56	I.*Ec. D.	15 7 35	I.*Tr. I.		
7 8 57 48	II. Sh. I.	18 13 37	I.*Oc. R.	16 25 26	I.*Sh. E.		
11 17 4	II. Tr. I.	19 12 18	III.*Sh. I.	17 16 16	I.*Tr. E.		
11 27 26	II. Sh. E.	21 7 27	III.*Sh. E.				
13 43 7	II. Tr. E.	23 23 9	III. Tr. I.	34 11 24 43	I. Ec. D.		
16 0 11	I.*Sh. I.			14 26 44	I.*Oc. R.		
17 7 16	I.*Tr. I.	16 1 5 55	III. Tr. E.				
18 9 22	I.*Sh. E.	6 34 49	II. Ec. D.	35 3 28 32	II. Sh. I.		
19 15 44	I.*Tr. E.	11 1 54	II. Oc. R.	5 12 26	II. Tr. I.		
		12 22 11	I. Sh. I.	5 58 58	II. Sh. E.		
8 13 7 48	I. Ec. D.	13 21 27	I. Tr. I.	7 38 47	II. Tr. E.		
15 13 12	III.*Sh. I.	14 31 36	I.*Sh. E.	8 44 13	I. Sh. I.		
16 25 54	I.*Oc. R.	15 30 2	I.*Tr. E.	9 33 56	I. Tr. I.		
17 7 8	III.*Sh. E.			10 53 53	I. Sh. E.		
19 49 37	III.*Tr. I.	17 9 30 27	I. Ec. D.	11 42 40	I. Tr. E.		
21 33 2	III.*Tr. E.	12 40 20	I. Oc. R.				
				36 5 53 20	I. Ec. D.		
9 4 0 8	II. Ec. D.	18 0 51 58	II. Sh. I.	8 53 14	I. Oc. R.		
8 40 32	II. Oc. R.	2 51 47	II. Tr. I.	12 58 26	III.*Ec. D.		
10 28 35	I. Sh. I.	3 22 4	II. Sh. E.	14 57 11	III.*Ec. R.		

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. * Visible at Washington.

GREENWICH MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV. No Eclipse.	

Configurations at 18^h 15^m for an Inverting Telescope.

Day.	West.	East.
1		1
2	3	1 4 2
3	3	2 1 4
4	2	4
5		1 3 4 2
6		1 2 3 4
7	1	2 3 4
8		2 3 1 4
9	3	1 2 4
10	3	1
11	4 3 1	
12	4	1 2
13	4	1 2 3
14	4	2 1 3
15	4	2 3 1
16	4	3 1 2
17	3 4	1
18	3 1 4	
19		2 3 1 4
20		1 2 3 4
21	2	1 3 4
22		2 3 4 1
23	3	1 2 4
24		3 2 1 4
25		2 3 1 4
26		1 2 3
27		1 3
28	4	1 3
29	4	2 1 3
30	1	4 3 2
31	4	3 1 2

GREENWICH MEAN TIME.

NOVEMBER.

d h m s		d h m s		d h m s		d h m s	
1 6 519	II. Sh. I.	9 20 58 7	III.*Ec. D.	18 8 32 57	I. Oc. R.	27 19 9 48	III.*Sh. I.
7 31 8	II. Tr. I.	22 59 7	III.*Ec. R.			19 24 42	III.*Tr. I.
8 36 4	II. Sh. E.	23 4 27	III.*Oc. D.	19 0 38 48	II. Sh. I.	21 9 17	III.*Tr. E.
9 57 44	II. Tr. E.				II. Tr. I.	21 12 36	III.*Sh. E.
10 37 57	I. Sh. I.	10 0 48 28	III. Oc. R.	3 10 11	II. Sh. E.	22 2 53	II.*Ec. D.
11 18 54	I. Tr. I.	3 36 3	II. Ec. D.	3 22 49	I. Sh. I.	23 45 34	I. Sh. I.
12 47 48	I.*Sh. E.	7 0 18	I. Sh. I.	3 38 19	I. Tr. I.	23 47 14	I. Tr. I.
13 27 45	I.*Tr. E.	7 0 48	II. Oc. R.	3 39 19	II. Tr. E.		
		7 29 2	I. Tr. I.	5 33 2	I. Sh. E.	28 0 33 41	II. Oc. R.
2 7 47 45	I. Ec. D.	9 10 21	I. Sh. E.	5 47 27	I. Tr. E.	1 55 54	I. Sh. E.
10 38 31	I. Oc. R.	9 38 2	I. Tr. E.			1 56 29	I. Tr. E.
16 58 7	III.*Ec. D.			20 0 34 19	I. Ec. D.	20 57 53	I.*Ec. D.
18 58 0	III.*Ec. R.	11 4 10 52	I. Ec. D.	2 58 56	I. Oc. R.	23 9 18	I.*Ec. R.
19 44 56	III.*Oc. D.	6 49 2	I. Oc. R.	15 10 9	III.*Sh. I.		
21 28 51	III.*Oc. R.	22 1 24	II.*Sh. I.	16 10 51	III.*Tr. I.	29 16 33 24	II.*Tr. I.
		22 56 38	II.*Tr. I.	17 11 44	III.*Sh. E.	16 34 54	II.*Sh. I.
3 1 1 26	II. Ec. D.			17 54 12	III.*Tr. E.	18 13 0	I.*Tr. I.
4 46 6	II. Oc. R.	12 0 32 34	II. Sh. E.	19 28 6	II.*Ec. D.	18 14 8	I.*Sh. I.
5 6 26	I. Sh. I.	1 23 42	II. Tr. E.	21 51 21	I.*Sh. I.	19 1 27	II.*Tr. E.
5 45 2	I. Tr. I.	1 28 47	I. Sh. I.	22 4 6	I.*Tr. I.	19 6 32	II.*Sh. E.
7 16 19	I. Sh. E.	1 54 57	I. Tr. I.	22 20 53	II.*Oc. R.	20 22 17	I.*Tr. E.
7 53 54	I. Tr. E.	3 38 52	I. Sh. E.			20 24 29	I.*Sh. E.
		4 3 59	I. Tr. E.	21 0 1 36	I. Sh. E.		
4 2 16 18	I. Ec. D.	22 39 35	I.*Ec. D.	0 13 16	I. Tr. E.	30 15 24 4	I.*Oc. D.
5 4 39	I. Oc. R.			19 2 59	I.*Ec. D.	17 38 8	I.*Ec. R.
19 24 14	II.*Sh. I.	18 1 15 7	I. Oc. R.	21 24 49	I.*Oc. R.		
20 40 17	II.*Tr. I.	11 10 44	III. Sh. I.				
21 55 8	II.*Sh. E.	12 55 49	III.*Tr. I.	22 13 57 9	II.*Sh. I.		
23 7 2	II.*Tr. E.	13 11 3	III.*Sh. E.	14 18 49	II.*Tr. I.		
23 34 53	I. Sh. I.	14 38 21	III.*Tr. E.	16 19 52	I.*Sh. I.		
		16 53 24	II.*Ec. D.	16 28 39	II.*Sh. E.		
5 0 11 6	I. Tr. I.	19 57 17	I.*Sh. I.	16 29 52	I.*Tr. I.		
1 44 49	I. Sh. E.	20 7 41	II.*Oc. R.	16 46 27	II.*Tr. E.		
2 20 1	I. Tr. E.	20 20 49	I.*Tr. I.	18 30 8	I.*Sh. E.		
20 44 59	I.*Ec. D.	22 7 24	I.*Sh. E.	18 39 4	I.*Tr. E.		
23 30 52	I. Oc. R.	22 29 53	I.*Tr. E.				
				23 13 31 45	I.*Ec. D.		
6 7 11 18	III. Sh. I.	14 17 8 13	I.*Ec. D.	15 50 47	I.*Oc. R.		
9 10 20	III. Sh. E.	19 41 3	I.*Oc. R.				
9 38 22	III. Tr. I.			24 4 59 9	III. Ec. D.		
11 20 28	III. Tr. E.	15 11 19 38	II.*Sh. I.	7 22 24	III. Oc. R.		
14 18 44	II.*Ec. D.	12 3 54	II.*Tr. I.	8 45 30	II. Ec. D.		
17 53 36	II.*Oc. R.	13 50 55	II.*Sh. E.	10 48 27	I.*Sh. I.		
18 3 21	I.*Sh. I.	14 25 46	I.*Sh. I.	10 55 40	I.*Tr. I.		
18 37 6	I.*Tr. I.	14 31 9	II.*Tr. E.	11 27 18	II.*Oc. R.		
20 13 19	I.*Sh. E.	14 46 39	I.*Tr. I.	12 58 44	I.*Sh. E.		
20 46 3	I.*Tr. E.	16 35 54	I.*Sh. E.	13 4 53	I.*Tr. E.		
		16 55 44	I.*Tr. E.				
7 15 13 35	I.*Ec. D.			25 8 0 24	I. Ec. D.		
17 56 56	I.*Oc. R.	16 11 36 57	I.*Ec. D.	10 16 38	I. Oc. R.		
		14 7 4	I.*Oc. R.				
8 8 42 22	II. Sh. I.			26 3 16 29	II. Sh. I.		
9 48 11	II. Tr. I.	17 0 58 54	III. Ec. D.	3 26 34	II. Tr. I.		
11 13 24	II. Sh. E.	4 6 25	III. Oc. R.	5 17 1	I. Sh. I.		
12 15 5	II.*Tr. E.	6 10 46	II. Ec. D.	5 21 28	I. Tr. I.		
12 31 48	I.*Sh. I.	8 54 18	I. Sh. I.	5 48 2	II. Sh. E.		
13 3 4	I.*Tr. I.	9 12 30	I. Tr. I.	5 54 26	II. Tr. E.		
14 41 48	I.*Sh. E.	9 14 24	II. Oc. R.	7 27 19	I. Sh. E.		
15 12 2	I.*Tr. E.	11 4 29	I. Sh. E.	7 30 41	I. Tr. E.		
		11 21 37	I.*Tr. E.				
9 9 42 17	I. Ec. D.			27 2 29 12	I. Ec. D.		
12 23 4	I.*Oc. R.	18 6 5 34	I. Ec. D.	4 42 37	I. Oc. R.		

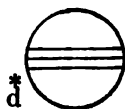
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

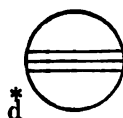
NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

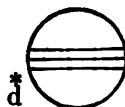
I.



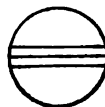
III.



II.



IV. No Eclipse.


Configurations at 17^h 15^m for an Inverting Telescope.

Day.	West.				East.			
1		·4	·3	· ⁸ ·1	○			
2		·4		·2	○	·1		·3●
3			·4	1·	○	·2	·3	
4					○	2·1·	3·	
5			2·	·1	○	3·	·4	
6				3·	1○·		·4	·2●
7			3·		○	2·	·4	·1●
8			·3	2·1·	○		·4	
9				·2	·3	○	·1	4·
10				1·	○	·2·3	4·	
11					○	· ⁸ ·1·	4·	·3
12			2·	·1	○	4·	3·	
13			4·	3·	○	1·		·2●
14			4·	3·		○	2·	·1●
15			4·	·3	2·1·	○		
16		4·		·2	·3	○	·1	
17		·4		1·	○		· ⁸ ·3	
18		·4			○	· ⁸ ·1	·3	
19			·4	2·	·1	○	3·	
20	○3·			·4	·2	○	1·	
21			3·		·1	○	·4	·2
22	○1·		·3		2·	○		·4
23				·2	·3	○	·1	·4
24				1·	○	· ⁸ ·3		·4
25					○	· ⁸ ·1	·3	4·
26				2·	·1	○	3·	4·
27					·23	○	1·	4·
28			3·		·1	○		· ⁸ ·3
29	○2·		·3		1○·			
30			4·	· ⁸ ·3	○			·1●

GREENWICH MEAN TIME.

DECEMBER.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s	
1	8	51	10	III. Oc. D.	10	8	32	24	II. Sh. I.	19	5	10	24	III. Tr. I.	28	1	9	59	I. Tr. I.
11	4	9		III.*Ec. R.		8	48	10	I. Tr. I.		5	29	2	I. Sh. I.		1	39	34	II. Tr. I.
11	13	14		II.*Oc. D.		9	5	48	I. Sh. I.		7	1	5	III. Tr. E.		1	52	27	I. Sh. I.
12	38	49		I.*Tr. I.		10	25	9	II.*Tr. E.		7	7	49	I. Tr. E.		3	7	33	II. Sh. I.
12	42	45		I.*Sh. I.		10	57	32	I.*Tr. E.		7	10	15	III. Sh. I.		3	19	24	I. Tr. E.
13	50	26		II.*Ec. R.		11	4	6	II.*Sh. E.		7	39	21	I. Sh. E.		4	2	40	I. Sh. E.
14	48	7		I.*Tr. E.		11	16	10	I.*Sh. E.		8	18	10	II. Ec. R.		4	9	25	II. Tr. E.
14	53	5		I.*Sh. E.							9	16	32	III. Sh. E.		5	39	10	II. Sh. E.
					11	5	59	55	I. Oc. D.							22	23	1	I. Oc. D.
						8	30	53	I. Ec. R.										
2	9	49	55	I. Oc. D.						20	2	10	44	I. Oc. D.					
12	6	50		I.*Ec. R.							4	55	1	I. Ec. R.	29	1	19	26	I. Ec. R.
					12	1	53	35	III. Tr. I.		23	20	50	II. Tr. I.		19	36	31	I.*Tr. I.
3	5	41	13	II. Tr. I.		2	32	35	II. Oc. D.		23	24	35	I. Tr. I.		20	11	1	II.*Oc. D.
	5	54	21	II. Sh. I.		3	10	5	III. Sh. I.		23	57	42	I. Sh. I.		20	21	10	I.*Sh. I.
	7	4	39	I. Tr. I.		3	14	7	I. Tr. I.							21	45	56	I. Tr. E.
	7	11	21	I. Sh. I.		3	34	26	I. Sh. I.	21	0	29	11	II. Sh. I.		22	1	16	III. Oc. D.
	8	9	30	II. Tr. E.		3	41	53	III. Tr. E.		1	34	0	I. Tr. E.		22	31	22	I. Sh. E.
	8	26	0	II. Sh. E.		5	15	14	III. Sh. E.		1	50	15	II. Tr. E.		23	57	41	III. Oc. R.
	9	13	57	I. Tr. E.		5	23	29	I. Tr. E.		2	7	59	I. Sh. E.					
	9	21	42	I. Sh. E.		5	42	57	II. Ec. R.		3	0	52	II. Sh. E.	30	0	11	11	II. Ec. R.
						5	44	47	I. Sh. E.		20	37	8	I.*Oc. D.		1	0	48	III. Ec. D.
4	4	15	56	I. Oc. D.							23	23	57	I. Ec. R.		3	10	21	III. Ec. R.
	6	35	41	I. Ec. R.	13	0	25	58	I. Oc. D.							16	49	35	I.*Oc. D.
	22	38	21	III.*Tr. I.		2	59	40	I. Ec. R.	22	17	50	52	I.*Tr. I.		19	48	16	I.*Ec. R.
	23	9	33	III.*Sh. I.		21	3	53	II.*Tr. I.		17	54	24	II.*Oc. D.	31	14	3	7	I.*Tr. I.
						21	40	6	I.*Tr. I.		18	26	23	I.*Sh. I.		14	49	53	I.*Sh. I.
5	0	19	30	II. Oc. D.		21	50	57	II.*Sh. I.		18	39	15	III.*Oc. D.		14	50	9	II.*Tr. I.
	0	24	36	III. Tr. E.		22	3	4	I.*Sh. I.		20	0	16	I.*Tr. E.		16	12	31	I.*Tr. E.
	1	13	32	III. Sh. E.		23	32	51	II. Tr. E.		20	32	59	III.*Oc. R.		16	27	15	II.*Sh. I.
	1	30	28	I. Tr. I.		23	49	29	I. Tr. E.		20	36	40	I.*Sh. E.		17	0	4	I.*Sh. E.
	1	39	56	I. Sh. I.							21	0	3	III.*Ec. D.		17	20	13	II.*Tr. E.
	3	7	54	II. Ec. R.	14	0	13	24	I. Sh. E.		21	35	48	II.*Ec. R.		18	58	46	II.*Sh. E.
	3	39	48	I. Tr. E.		0	22	41	II. Sh. E.		23	8	18	III. Ec. R.					
	3	50	18	I. Sh. E.		18	52	9	I.*Oc. D.	23	15	3	26	I.*Oc. D.					
	22	41	49	I.*Oc. D.		21	28	33	I.*Ec. R.		17	52	44	I.*Ec. R.					
6	1	4	25	I. Ec. R.	15	15	20	51	III.*Oc. D.										
	18	48	14	II.*Tr. I.		15	39	31	II.*Oc. D.	24	12	17	12	I.*Tr. I.					
	19	12	51	II.*Sh. I.		16	6	10	I.*Tr. I.		12	30	26	II.*Tr. I.					
	19	56	19	I.*Tr. I.		16	31	43	I.*Sh. I.		12	55	5	I.*Sh. I.					
	20	8	32	I.*Sh. I.		18	15	33	I.*Tr. E.		13	48	52	II.*Sh. I.					
	21	16	44	II.*Tr. E.		18	42	3	I.*Sh. E.		14	26	36	II.*Tr. E.					
	21	44	33	II.*Sh. E.		19	0	32	II.*Ec. R.		15	0	4	II.*Tr. E.					
	22	5	40	I.*Tr. E.		19	6	35	III.*Ec. R.		15	5	20	I.*Sh. E.					
	22	18	54	I.*Sh. E.							16	20	29	II.*Sh. E.					
7	17	7	53	I.*Oc. D.	16	13	18	15	I.*Oc. D.	25	9	29	55	I. Oc. D.					
	19	33	16	I.*Ec. R.		15	57	19	I.*Ec. R.		12	21	40	I.*Ec. R.					
8	12	5	17	III.*Oc. D.	17	10	12	39	II. Tr. I.	26	6	43	34	I. Tr. I.					
	13	25	57	II.*Oc. D.		10	32	17	I.*Tr. I.		7	2	28	II. Oc. D.					
	14	22	14	I.*Tr. I.		11	0	23	I.*Sh. I.		7	23	45	I. Sh. I.					
	14	37	10	I.*Sh. I.		11	10	34	II.*Sh. I.		8	30	37	III. Tr. I.					
	15	5	19	III.*Ec. R.		12	41	40	I.*Tr. E.		8	52	59	I. Tr. E.					
	16	25	25	II.*Ec. R.		13	10	42	I.*Sh. E.		9	34	0	I. Sh. E.					
	16	31	34	I.*Tr. E.		13	42	15	II.*Sh. E.		10	23	52	III.*Tr. E.					
	16	47	32	I.*Sh. E.							10	53	29	II.*Ec. R.					
9	11	33	49	I.*Oc. D.	18	7	44	31	I. Oc. D.		11	10	49	III.*Sh. I.					
	14	2	1	I.*Ec. R.		10	26	13	I.*Ec. R.		13	18	14	III.*Sh. E.					
10	7	56	25	II. Tr. I.	19	4	46	46	II. Oc. D.	27	3	56	23	I. Oc. D.					
						4	58	24	I. Tr. I.		6	50	29	I. Ec. R.					

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

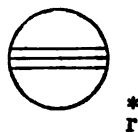
DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.



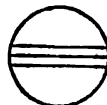
III.



II.



IV. No Eclipse.



Configurations at 16^h 15^m for an Inverting Telescope.

Day.	West.	East.
1	4.	1. \bigcirc $\frac{2}{3}$
2	4.	\bigcirc .1 2. .3
3	4.	$\frac{2}{1}$. \bigcirc 3.
4	.4	.2 \bigcirc 3.1.
5	.4 3. .1	\bigcirc .2
6	3. .4	\bigcirc 2.1.
7	$\frac{2}{3}$.4	\bigcirc $\frac{1}{1}$
8	\bigcirc 1.	\bigcirc .3 .4 .2 ●
9		\bigcirc .1 2. .3 .4
10		$\frac{2}{1}$. \bigcirc 3. .4
11	.2	\bigcirc $\frac{2}{1}$.4
12	3.1	\bigcirc .2 4.
13	3.	\bigcirc $\frac{2}{1}$ 4.
14	.32. .1	\bigcirc 4.
15	\bigcirc 1.	\bigcirc 4. .2 ● .3 ●
16		4. \bigcirc .1 2. .3
17	4.	$\frac{2}{1}$. \bigcirc 3.
18	4.	.2 \bigcirc $\frac{2}{1}$
19	4.	$\frac{2}{1}$. \bigcirc .2
20	.4 3.	\bigcirc $\frac{2}{1}$
21	.4 .3 2. .1	\bigcirc
22	.4	$\frac{2}{3}$. \bigcirc 1.
23	.4	\bigcirc $\frac{2}{3}$.1 ●
24		$\frac{2}{1}$. \bigcirc 3.
25	.2	\bigcirc .1 3. .4
26	1.3.	\bigcirc .2 .4
27	3.	\bigcirc $\frac{2}{1}$.4
28	.3 2. .1	\bigcirc .4
29	$\frac{2}{3}$	\bigcirc 1. 4.
30	.1	\bigcirc 1. $\frac{2}{3}$ 4.
31	\bigcirc 2.	\bigcirc 4. .3

658 MAGNITUDE AND RINGS OF SATURN, 1917.

ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE,
AND MAGNITUDE OF SATURN'S RINGS.

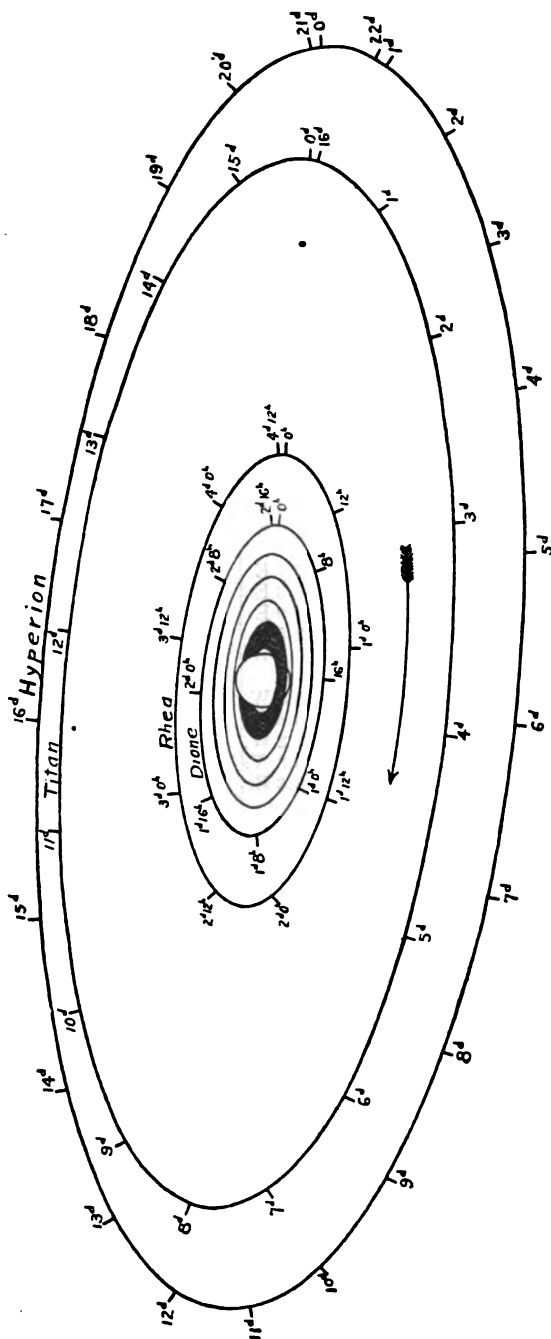
Greenwich Mean Midnight.		<i>a</i>	<i>b</i>	<i>P</i>	<i>B</i>	<i>U</i>	ω	<i>B'</i>	<i>U'</i>	
		"	"	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	
Jan.	1	46.23	-16.78	-7 18.6	-21 17.2	356 5.0	42 23.4	-21 51.6	311 47.9	-0.1
	9	46.40	17.03	7 18.6	21 30.1	355 26.8	42 23.3	21 46.8	312 6.3	-0.1
	17	46.46	17.23	7 18.7	21 43.6	354 47.0	42 23.3	21 41.9	312 24.7	-0.1
	25	46.39	17.35	7 18.5	21 56.8	354 7.0	42 23.2	21 37.0	312 43.1	-0.1
Feb.	2	46.22	17.43	7 18.4	22 9.4	353 28.4	42 23.2	21 32.0	313 1.5	-0.1
	10	45.92	-17.46	-7 18.2	-22 20.8	352 52.9	42 23.2	-21 27.0	313 19.9	-0.1
	18	45.55	17.44	7 17.9	22 31.0	352 21.2	42 23.1	21 22.0	313 38.2	-0.1
	26	45.08	17.36	7 17.7	22 39.4	351 54.8	42 23.1	21 16.9	313 56.5	+0.1
Mar.	6	44.56	17.24	7 17.6	22 45.8	351 34.6	42 23.0	21 11.8	314 14.8	-0.1
	14	43.98	17.07	7 17.5	22 50.3	351 21.2	42 23.0	21 6.6	314 33.0	-0.1
	22	43.38	-16.86	-7 17.5	-22 52.7	351 14.8	42 23.0	-21 1.4	314 51.2	+0.1
	30	42.74	16.62	7 17.5	22 52.8	351 15.7	42 22.9	20 56.3	315 9.4	-0.1
Apr.	7	42.12	16.36	7 17.6	22 51.1	351 24.0	42 22.9	20 51.1	315 27.6	-0.1
	15	41.49	16.07	7 17.8	22 47.0	351 39.5	42 22.9	20 45.8	315 45.7	-0.1
	23	40.90	15.77	7 18.0	22 41.0	352 1.7	42 22.8	20 40.6	316 3.8	-0.1
May	1	40.33	-15.47	-7 18.2	-22 33.4	352 30.4	42 22.8	-20 35.3	316 21.8	-0.1
	9	39.80	15.16	7 18.5	22 23.6	353 4.9	42 22.7	20 30.1	316 39.9	-0.1
	17	39.30	14.85	7 18.7	22 12.1	353 44.6	42 22.7	20 24.7	316 57.9	-0.1
	25	38.85	14.54	7 19.0	21 58.9	354 29.1	42 22.7	20 19.3	317 15.8	-0.1
June	2	38.45	14.24	7 19.1	21 44.4	355 18.0	42 22.6	20 13.9	317 33.8	-0.1
	10	38.10	-13.94	-7 19.1	-21 28.3	356 10.3	42 22.6	-20 8.5	317 51.8	+0.1
	18	37.80	13.66	7 19.0	21 10.9	357 5.5	42 22.6	20 2.9	318 9.7	-0.1
	26	37.56	13.38	7 18.7	20 52.3	358 3.2	42 22.5	19 57.4	318 27.6	-0.1
July	4	37.37	13.11	7 18.3	20 32.8	359 2.6	42 22.5	19 51.8	318 45.5	-0.1
	12	37.24	12.86	7 17.7	20 12.6	0 3.3	42 22.5	19 46.3	319 3.4	-0.1
	20	37.16	-12.62	-7 17.0	-19 51.5	1 4.8	42 22.4	-19 40.7	319 21.2	+0.1
	28	37.14	12.40	7 16.1	19 29.9	2 6.5	42 22.4	19 35.0	319 38.9	-0.1
Aug.	5	37.17	12.19	7 15.2	19 8.3	3 7.9	42 22.3	19 29.4	319 56.7	-0.1
	13	37.26	12.00	7 14.1	18 46.6	4 8.3	42 22.3	19 23.7	320 14.5	-0.1
	21	37.41	11.82	7 12.8	18 25.0	5 7.4	42 22.3	19 18.0	320 32.2	-0.1
	29	37.61	-11.66	-7 11.5	-18 3.6	6 4.7	42 22.2	-19 12.2	320 49.9	+0.1
Sept.	6	37.87	11.52	7 10.1	17 43.0	6 59.4	42 22.2	19 6.5	321 7.6	-0.1
	14	38.19	11.41	7 8.6	17 23.4	7 51.2	42 22.2	19 0.7	321 25.2	-0.1
	22	38.56	11.32	7 7.3	17 4.7	8 39.8	42 22.1	18 54.8	321 42.8	-0.1
	30	38.97	11.26	7 5.9	16 47.9	9 24.2	42 22.1	18 49.0	322 0.5	-0.1
Oct.	8	39.44	-11.22	-7 4.7	-16 32.5	10 4.3	42 22.0	-18 43.1	322 18.1	+0.1
	16	39.94	11.22	7 3.5	16 19.1	10 39.2	42 22.0	18 37.3	322 35.6	-0.1
	24	40.49	11.25	7 2.5	16 7.9	11 8.8	42 22.0	18 31.3	322 53.2	-0.1
Nov.	1	41.06	11.31	7 1.7	15 59.3	11 32.5	42 21.9	18 25.4	323 10.7	-0.1
	9	41.67	11.41	7 1.1	15 53.3	11 49.9	42 21.9	18 19.5	323 28.1	-0.1
	17	42.28	-11.54	-7 0.7	-15 50.0	12 0.8	42 21.9	-18 13.6	323 45.6	+0.1
	25	42.91	11.70	7 0.6	15 49.9	12 4.9	42 21.8	18 7.6	324 3.0	-0.1
Dec.	3	43.51	11.90	7 0.7	15 52.4	12 2.0	42 21.8	18 1.6	324 20.4	-0.1
	11	44.09	12.13	7 1.1	15 58.0	11 52.5	42 21.7	17 55.5	324 37.7	-0.1
	19	44.62	12.38	7 1.9	16 6.2	11 36.6	42 21.7	17 49.4	324 55.1	-0.1
	27	45.10	-12.64	-7 2.8	-16 17.0	11 14.6	42 21.7	-17 43.4	325 12.4	+0.1

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring=0.8801,	log factor=9.9445
The outer ellipse of the inner ring=0.8599,	log factor=9.9344
The inner ellipse of the inner ring=0.6650,	log factor=9.8228
The inner ellipse of the dusky ring=0.5486,	log factor=9.7392

NOTE.—The negative sign of *B* indicates that the visible surface of the rings is the southern one.

South



North

NAMES OF THE SATELLITES.

- I. Mimas.
- II. Enceladus.
- III. Tethys.
- IV. Dione.
- V. Rhea.
- VI. Titan.
- VII. Hyperion.
- VIII. Iapetus.
- IX. Phoebe.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT DATE OF OPPOSITION, JANUARY 17, 1917,

AS SEEN IN AN INVERTING TELESCOPE.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	523	15.6

GREENWICH MEAN TIME.

In the diagram on the preceding page, the points of the orbits marked "0" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular, and the time of any greatest elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. For Titan, Hyperion, and Iapetus the eccentricity is taken into account, and for Iapetus the times both of the greatest elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., Eastern Elongation.
W., Western Elongation.

I., Inferior Conjunction (north of planet).
S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible in the United States.

Jan.	d h	Jan.	d h	Feb.	d h	Apr.	d h	Oct.	d h	Nov.	d h
1 19.0 E.		29 14.0 W.		25 21.9 W.		3 16.0 W.		12 23.4 W.		27 16.4 E.	
2 17.6 E.		30 1.4 E.		26 20.5 W.		4 14.6 W.		13 22.0 W.		30 0.9 W.	
3 16.2 E.		30 12.7 W.		27 19.1 W.		5 13.3 W.		14 20.6 W.		30 23.5 W.	
4 14.8 E.		31 0.0 E.		28 17.7 W.		8 20.4 E.		15 19.3 W.		Dec. 1 22.2 W.	
5 2.1 W.		31 11.3 W.		Mar. 1 16.4 W.		9 19.0 E.		20 1.1 E.		2 20.8 W.	
5 13.4 E.		31 22.6 E.		2 15.0 W.		10 17.7 E.		20 23.7 E.		3 19.4 W.	
6 0.8 W.		Feb. 1 21.2 E.		3 13.6 W.		11 16.3 E.		21 22.3 E.		4 18.0 W.	
6 12.1 E.		2 19.8 E.		4 12.2 W.		12 14.9 E.		22 20.9 E.		5 16.6 W.	
6 23.4 W.		3 18.4 E.		5 22.2 E.		13 13.5 E.		23 19.5 E.		6 15.2 W.	
7 22.0 W.		4 17.0 E.		6 20.8 E.		17 19.3 W.		24 18.1 E.		8 1.2 E.	
8 20.6 W.		5 15.6 E.		7 19.4 E.		18 18.0 W.		28 1.3 W.		8 23.8 E.	
9 19.2 W.		6 14.2 E.		8 18.0 E.		19 16.6 W.		28 23.9 W.		9 22.4 E.	
10 17.8 W.		7 12.9 E.		9 16.7 E.		20 15.2 W.		29 22.5 W.		10 21.0 E.	
11 16.4 W.		8 0.2 W.		10 15.3 E.		21 13.8 W.		30 21.2 W.		11 19.6 E.	
12 15.0 W.		8 11.5 E.		11 13.9 E.		25 19.6 E.		31 19.8 W.		12 18.3 E.	
13 13.6 W.		8 22.8 W.		12 12.5 E.		26 18.3 E.		Nov. 1 18.4 W.		13 16.9 E.	
14 1.0 E.		9 21.4 W.		13 22.4 W.		27 16.9 E.		6 0.2 E.		14 15.5 E.	
14 12.3 W.		10 20.0 W.		14 21.0 W.		28 15.5 E.		6 22.8 E.		16 1.4 W.	
14 23.6 E.		11 18.6 W.		15 19.7 W.		29 14.1 E.		7 21.4 E.		17 0.0 W.	
15 22.2 E.		12 17.2 W.		16 18.3 W.		May 4 18.6 W.		8 20.0 E.		17 22.7 W.	
16 20.8 E.		13 15.8 W.		17 16.9 W.		5 17.2 W.		9 18.6 E.		18 21.3 W.	
17 19.4 E.		14 14.4 W.		18 15.5 W.		6 15.8 W.		10 17.3 E.		19 19.9 W.	
18 18.0 E.		15 13.1 W.		19 14.1 W.		7 14.4 W.		13 1.8 W.		20 18.5 W.	
19 16.6 E.		16 0.4 E.		20 12.8 W.		8 13.1 W.		14 0.4 W.		21 17.1 W.	
20 15.2 E.		16 11.7 W.		22 21.3 E.		13 17.5 E.		14 23.0 W.		22 15.7 W.	
21 13.8 E.		16 23.0 E.		23 19.9 E.		14 16.1 E.		15 21.7 W.		23 14.3 W.	
22 1.2 W.		17 21.6 E.		24 18.5 E.		15 14.7 E.		16 20.3 W.		24 1.6 E.	
22 12.5 E.		18 20.2 E.		25 17.2 E.		16 13.4 E.		17 18.9 W.		25 0.2 E.	
22 23.8 W.		19 18.8 E.		26 15.8 E.		...		18 17.5 W.		25 22.8 E.	
23 22.4 W.		20 17.4 E.		27 14.4 E.		...		22 0.7 E.		26 21.4 E.	
24 21.0 W.		21 16.1 E.		28 13.0 E.		Oct. 4 0.5 E.		22 23.3 E.		27 20.0 E.	
25 19.6 W.		22 14.7 E.		30 21.5 W.		4 23.1 E.		23 21.9 E.		28 18.6 E.	
26 18.2 W.		23 13.3 E.		31 20.2 W.		5 21.7 E.		24 20.5 E.		29 17.3 E.	
27 16.8 W.		24 11.9 E.		Apr. 1 18.8 W.		6 20.3 E.		25 19.1 E.		30 15.9 E.	
28 15.4 W.		24 23.3 W.		2 17.4 W.		12 0.8 W.		26 17.8 E.		31 14.5 E.	

SATELLITES OF SATURN, 1917.

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GREENWICH MEAN TIME.

ENCELADUS.

Jan.	d h	Feb.	d h	Mar.	d h	May	d h	Oct.	d h	Nov.	d h
Jan.	2 7.9 E.	Feb.	11 1.5 E.	Mar.	22 19.0 E.	May	1 13.0 E.	Oct.	18 12.4 E.	Nov.	27 6.1 E.
	3 16.8 E.		12 10.4 E.		24 3.9 E.		2 21.8 E.		19 21.3 E.		28 15.0 E.
	5 1.7 E.		13 19.3 E.		25 12.8 E.		4 6.7 E.		21 6.2 E.		29 23.9 E.
	6 10.6 E.		15 4.1 E.		26 21.7 E.		5 15.6 E.		22 15.1 E.	Dec.	1 8.7 E.
	7 19.4 E.		16 13.0 E.		28 6.6 E.		7 0.5 E.		24 0.0 E.		2 17.6 E.
	9 4.3 E.		17 21.8 E.		29 15.5 E.		8 9.4 E.		25 8.9 E.		4 2.5 E.
	10 13.2 E.		19 6.7 E.		31 0.4 E.		9 18.3 E.		26 17.7 E.		5 11.4 E.
	11 22.1 E.		20 15.6 E.	Apr.	1 9.2 E.		11 3.2 E.		28 2.6 E.		6 20.3 E.
	13 7.0 E.		22 0.5 E.		2 18.1 E.		12 12.1 E.		29 11.5 E.		8 5.2 E.
	14 15.9 E.		23 9.4 E.		4 3.0 E.		13 21.0 E.		30 20.4 E.		9 14.0 E.
	16 0.7 E.		24 18.2 E.		5 11.9 E.		15 5.9 E.	Nov.	1 5.3 E.		10 22.9 E.
	17 9.6 E.		26 3.1 E.		6 20.8 E.		16 14.8 E.		2 14.2 E.		12 7.8 E.
	18 18.5 E.		27 12.0 E.		8 5.7 E.		17 23.7 E.		3 23.1 E.		13 16.7 E.
	20 3.4 E.		28 20.9 E.		9 14.6 E.		19 8.5 E.		5 8.0 E.		15 1.6 E.
	21 12.3 E.	Mar.	2 5.8 E.		10 23.5 E.		....		6 16.8 E.		16 10.5 E.
	22 21.2 E.		3 14.7 E.		12 8.4 E.		....		8 1.7 E.		17 19.3 E.
	24 6.1 E.		4 23.5 E.		13 17.3 E.	Sept.	30 16.7 E.		9 10.6 E.		19 4.2 E.
	25 15.0 E.		6 8.4 E.		15 2.2 E.	Oct.	2 1.6 E.		10 19.5 E.		20 13.1 E.
	26 23.9 E.		7 17.3 E.		16 11.1 E.		3 10.5 E.		12 4.4 E.		21 22.0 E.
	28 8.8 E.		9 2.2 E.		17 20.0 E.		4 19.4 E.		13 13.3 E.		23 6.8 E.
	29 17.7 E.		10 11.1 E.		19 4.9 E.		6 4.3 E.		14 22.1 E.		24 15.7 E.
	31 2.6 E.		11 19.9 E.		20 13.8 E.		7 13.2 E.		16 7.0 E.		26 0.6 E.
Feb.	1 11.5 E.		13 4.8 E.		21 22.7 E.		8 22.1 E.		17 15.9 E.		27 9.4 E.
	2 20.4 E.		14 13.7 E.		23 7.6 E.		10 7.0 E.		19 0.8 E.		28 18.3 E.
	4 5.3 E.		15 22.6 E.		24 16.5 E.		11 15.9 E.		20 9.7 E.		30 3.1 E.
	5 14.1 E.		17 7.5 E.		26 1.4 E.		13 0.8 E.		21 18.6 E.		31 12.0 E.
	6 23.0 E.		18 16.4 E.		27 10.3 E.		14 9.7 E.		23 3.4 E.		
	8 7.8 E.		20 1.2 E.		28 19.2 E.		15 18.6 E.		24 12.3 E.		
	9 16.7 E.		21 10.1 E.		30 4.1 E.		17 3.5 E.		25 21.2 E.		

TETHYS.

Jan.	d h	Feb.	d h	Mar.	d h	Apr.	d h	Oct.	d h	Nov.	d h
Jan.	1 4.2 E.	Feb.	9 19.3 E.	Mar.	21 10.6 E.	Apr.	30 2.3 E.	Oct.	15 4.9 E.	Nov.	23 20.4 E.
	3 1.5 E.		11 16.6 E.		23 7.9 E.	May	1 23.6 E.		17 2.2 E.		25 17.7 E.
	4 22.8 E.		13 13.8 E.		25 5.2 E.		3 20.9 E.		18 23.5 E.		27 15.1 E.
	6 20.1 E.		15 11.1 E.		27 2.5 E.		5 18.2 E.		20 20.8 E.		29 12.4 E.
	8 17.4 E.		17 8.4 E.		28 23.8 E.		7 16.6 E.		22 18.2 E.	Dec.	1 9.7 E.
	10 14.7 E.		19 5.7 E.		30 21.1 E.		9 12.9 E.		24 15.5 E.		3 7.0 E.
	12 11.9 E.		21 3.0 E.		1 18.4 E.		11 10.2 E.		26 12.8 E.		5 4.3 E.
	14 9.2 E.		23 0.3 E.	Apr.	3 15.7 E.		13 7.5 E.		28 10.1 E.		7 1.6 E.
	16 6.5 E.		24 21.6 E.		5 13.0 E.		15 4.9 E.		30 7.5 E.		8 22.9 E.
	18 3.8 E.		26 18.9 E.		7 10.3 E.		17 2.2 E.	Nov.	1 4.8 E.		10 20.2 E.
	20 1.1 E.		28 16.2 E.		9 7.6 E.		18 23.5 E.		3 2.1 E.		12 17.5 E.
	21 22.4 E.	Mar.	2 13.5 E.		11 4.9 E.		....		4 23.4 E.		14 14.8 E.
	23 19.7 E.		4 10.8 E.		13 2.3 E.		....		6 20.7 E.		16 12.1 E.
	25 17.0 E.		6 8.1 E.		14 23.6 E.	Sept.	30 2.3 E.		8 18.0 E.		18 9.4 E.
	27 14.2 E.		8 5.4 E.		16 21.0 E.	Oct.	1 23.6 E.		10 15.3 E.		20 6.7 E.
	29 11.5 E.		10 2.7 E.		18 18.3 E.		3 20.9 E.		12 12.6 E.		22 4.0 E.
	31 8.8 E.		12 0.0 E.		20 15.6 E.		5 18.3 E.		14 9.9 E.		24 1.3 E.
Feb.	2 6.1 E.		13 21.3 E.		22 13.0 E.		7 15.6 E.		16 7.2 E.		25 22.6 E.
	4 3.4 E.		15 18.7 E.		24 10.3 E.		9 12.9 E.		18 4.5 E.		27 19.9 E.
	6 0.7 E.		17 16.0 E.		26 7.6 E.		11 10.2 E.		20 1.8 E.		29 17.1 E.
	7 22.0 E.		19 13.3 E.		28 4.9 E.		13 7.6 E.		21 23.1 E.		31 14.4 E.

SATELLITES OF SATURN, 1917.

GREENWICH MEAN TIME.

DIONE.

	d h		d h		d h		d h		d h		d h
Jan.	1 6.4 E.	Feb.	11 7.0 E.	Mar.	24 8.1 E.	May	4 9.6 E.	Oct.	21 5.5 E.	Dec.	1 6.9 E.
	4 0.0 E.		14 0.6 E.		27 1.8 E.		7 3.4 E.		23 23.2 E.		4 0.6 E.
	6 17.6 E.		16 18.3 E.		29 19.5 E.		9 21.1 E.		26 16.9 E.		6 18.3 E.
	9 11.3 E.		19 11.9 E.	Apr.	1 13.1 E.		12 14.8 E.		29 10.7 E.		9 12.0 E.
	12 4.9 E.		22 5.6 E.		4 6.8 E.		15 8.5 E.	Nov.	1 4.4 E.		12 5.7 E.
	14 22.5 E.		24 23.3 E.		7 0.5 E.		18 2.3 E.		3 22.1 E.		14 23.3 E.
	17 16.2 E.		27 16.9 E.		9 18.2 E.		.....		6 15.8 E.		17 17.0 E.
	20 9.8 E.	Mar.	2 10.6 E.		12 11.9 E.		.....		9 9.5 E.		20 10.7 E.
	23 3.4 E.		5 4.3 E.		15 5.6 E.	Oct.	2 1.5 E.		12 3.1 E.		23 4.3 E.
	25 21.1 E.		7 22.0 E.		17 23.3 E.		4 19.2 E.		14 20.8 E.		25 22.0 E.
	28 14.7 E.		10 15.7 E.		20 17.1 E.		7 12.9 E.		17 14.5 E.		28 15.6 E.
	31 8.4 E.		13 9.4 E.		23 10.8 E.		10 6.6 E.		20 8.2 E.		31 9.3 E.
Feb.	3 2.0 E.		16 3.0 E.		26 4.5 E.		13 0.4 E.		23 1.9 E.		
	5 19.7 E.		18 20.7 E.		28 22.2 E.		15 18.1 E.		25 19.6 E.		
	8 13.3 E.		21 14.4 E.	May	1 15.9 E.		18 11.8 E.		28 13.2 E.		

RHEA.

	d h		d h		d h		d h		d h		d h
Jan.	3 23.9 E.	Feb.	13 14.7 E.	Mar.	26 6.1 E.	May	5 22.5 E.	Oct.	15 19.0 E.	Nov.	25 11.1 E.
	8 12.2 E.		18 3.1 E.		30 18.6 E.		10 11.0 E.		20 7.5 E.		29 23.5 E.
	13 0.5 E.		22 15.4 E.	Apr.	4 7.0 E.		14 23.6 E.		24 20.0 E.	Dec.	4 11.9 E.
	17 12.8 E.		27 3.8 E.		8 19.5 E.		19 12.1 E.		29 8.4 E.		9 0.3 E.
	22 1.1 E.	Mar.	3 16.1 E.		13 8.0 E.		.....	Nov.	2 20.9 E.		13 12.7 E.
	26 13.4 E.		8 4.5 E.		17 20.5 E.		.....		7 9.4 E.		18 1.1 E.
	31 1.7 E.		12 16.9 E.		22 9.0 E.	Oct.	2 5.4 E.		11 21.8 E.		22 13.4 E.
Feb.	4 14.1 E.		17 5.3 E.		26 21.5 E.		6 18.0 E.		16 10.3 E.		27 1.8 E.
	9 2.4 E.		21 17.7 E.	May	1 10.0 E.		11 6.5 E.		20 22.7 E.		31 14.1 E.

TITAN.

	d h		d h		d h		d h		d h		d h
Jan.	7 5.7 E.	Feb.	15 16.3 W.	Mar.	27 18.6 E.	May	6 10.2 W.	Oct.	13 16.2 W.	Nov.	22 20.8 E.
	14 21.6 W.		23 22.0 E.	Apr.	4 11.2 W.		14 17.2 E.		21 22.4 E.		30 13.9 W.
	23 3.0 E.	Mar.	3 14.1 W.		12 17.7 E.		.....		29 15.9 W.	Dec.	8 19.4 E.
	30 18.9 W.		11 20.1 E.		20 10.5 W.		.....	Nov.	6 21.8 E.		16 12.2 W.
Feb.	8 0.4 E.		19 12.4 W.		28 17.2 E.	Oct.	5 22.5 E.		14 15.2 W.		24 17.4 E.

HYPERION.

	d h		d h		d h		d h		d h		d h
Jan.	5 12.4 E.	Feb.	16 15.7 E.	Mar.	30 22.3 E.	May	12 10.8 E.	Oct.	21 3.9 W.	Dec.	2 23.1 W.
	17 1.5 W.		28 5.3 W.	Apr.	11 13.6 W.		.....		31 1.4 E.		12 20.8 E.
	26 13.9 E.	Mar.	9 18.4 E.		21 3.9 E.		.....	Nov.	11 14.0 W.		24 7.4 W.
Feb.	7 3.0 W.		21 8.7 W.	May	2 19.7 W.	Oct.	9 14.2 E.		21 11.6 E.		

IAPETUS.

	d h		d h		d h		d h		d h		d h
Jan.	10 8.5 E.	Feb.	17 16.8 W.	Mar.	29 18.9 E.	May	8 3.7 W.	Oct.	17 10.2 W.	Nov.	27 10.3 E.
	30 2.6 I.	Mar.	9 0.5 S.	Apr.	19 1.3 I.		.....	Nov.	6 11.4 S.	Dec.	17 3.2 I.

DIFFERENTIAL COORDINATES OF PHOEBE.

FOR GREENWICH MEAN NOON.

Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$
	m s	' "		m s	' "		m s	' "
Jan. 0	+2 9.7	-6 15	Apr. 14	+1 47.5	-1 30	Sept. 20	-1 48.4	+ 8 34
2	2 11.6	6 14	16	1 45.2	1 24	22	1 50.3	8 41
4	2 13.3	6 12	18	1 42.8	1 18	24	1 52.2	8 48
6	2 15.0	6 10	20	1 40.4	1 12	26	1 54.1	8 54
8	2 16.6	6 7	22	1 37.9	1 6	28	1 55.9	9 0
10	+2 18.1	-6 4	24	+1 35.4	-1 0	30	-1 57.6	+ 9 6
12	2 19.5	6 1	26	1 32.8	0 54	Oct. 2	1 59.3	9 12
14	2 20.8	5 58	28	1 30.2	0 48	4	2 1.0	9 18
16	2 22.0	5 54	30	1 27.6	0 42	6	2 2.6	9 23
18	2 23.0	5 50	May 2	1 25.0	0 36	8	2 4.2	9 28
20	+2 24.0	-5 46	4	+1 22.3	-0 29	10	-2 5.7	+ 9 33
22	2 24.9	5 41	6	1 19.6	0 23	12	2 7.2	9 38
24	2 25.7	5 36	8	1 16.8	0 17	14	2 8.6	9 42
26	2 26.4	5 31	10	1 14.0	0 11	16	2 9.9	9 46
28	2 27.0	5 26	12	1 11.2	-0 5	18	2 11.2	9 50
30	+2 27.6	-5 21	14	+1 8.4	+0 2	20	-2 12.5	+ 9 54
Feb. 1	2 28.0	5 16	16	1 5.5	0 8	22	2 13.7	9 57
3	2 28.3	5 10	18	1 2.7	0 15	24	2 14.9	10 0
5	2 28.5	5 4	20	0 59.8	0 21	26	2 16.0	10 2
7	2 28.7	4 58	22	0 56.9	0 28	28	2 17.0	10 4
9	+2 28.7	-4 52	24	+0 53.9	+0 34	30	-2 18.0	+10 6
11	2 28.6	4 46	26	0 51.0	0 41	Nov. 1	2 19.0	10 8
13	2 28.5	4 40	28	0 48.0	0 48	3	2 19.8	10 9
15	2 28.2	4 33	30	0 45.1	0 54	5	2 20.6	10 10
17	2 27.9	4 27	June 1	0 42.1	1 1	7	2 21.4	10 11
19	+2 27.5	-4 21	3	+0 39.1	+1 8	9	-2 22.1	+10 11
21	2 27.0	4 14	5	0 36.1	1 15	11	2 22.8	10 11
23	2 26.4	4 8	7	0 33.0	1 23	13	2 23.4	10 11
25	2 25.7	4 1	9	0 30.0	1 30	15	2 23.9	10 10
27	2 25.0	3 55	11	0 27.0	1 37	17	2 24.4	10 9
Mar. 1	+2 24.1	-3 48	13	+0 24.0	+1 44	19	-2 24.8	+10 8
3	2 23.2	3 42	15	0 20.9	1 52	21	2 25.1	10 6
5	2 22.2	3 35	17	0 17.9	2 0	23	2 25.4	10 4
7	2 21.1	3 28	19	0 14.9	2 7	25	2 25.6	10 1
9	2 20.0	3 22	21	0 11.8	2 15	27	2 25.8	9 58
11	+2 18.7	-3 16	23	+0 8.8	+2 23	29	-2 25.9	+ 9 55
13	2 17.4	3 9	25	0 5.8	2 31	Dec. 1	2 25.9	9 51
15	2 16.0	3 3	27	+0 2.8	+2 39	3	2 25.9	9 47
17	2 14.6	2 56		....	...	5	2 25.8	9 43
19	2 13.0	2 50		....	...	7	2 25.6	9 38
21	+2 11.4	-2 44	Aug. 27	-1 22.3	+7 2	9	-2 25.3	+ 9 33
23	2 9.8	2 37	29	1 24.7	7 10	11	2 25.0	9 27
25	2 8.0	2 31	31	1 27.0	7 18	13	2 24.6	9 21
27	2 6.2	2 25	Sept. 2	1 29.3	7 26	15	2 24.2	9 15
29	2 4.4	2 19	4	1 31.6	7 34	17	2 23.6	9 8
31	+2 2.5	-2 12	6	-1 33.8	+7 42	19	-2 23.0	+ 9 1
Apr. 2	2 0.5	2 6	8	1 36.0	7 50	21	2 22.4	8 53
4	1 58.5	2 0	10	1 38.2	7 58	23	2 21.6	8 46
6	1 56.4	1 54	12	1 40.3	8 5	25	2 20.8	8 38
8	1 54.3	1 48	14	1 42.4	8 13	27	2 19.9	8 29
10	+1 52.1	-1 42	16	-1 44.4	+8 20	29	-2 18.9	+ 8 20
12	+1 49.8	-1 36	18	-1 46.5	+8 27	31	-2 17.8	+ 8 11

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.	Enceladus.		Tethys.		Time from Eastern Elongation.	Dione.	
	p^1	F		p^1	F	p^1	F		p^1	F
h	.		d h	.		.		d h	.	
0.0	83.2	1.000	0 0	83.2	1.000	83.2	1.000	0 0	83.2	1.000
0.5	80.4	0.992	0 1	79.1	0.984	80.1	0.992	0 2	79.1	0.984
1.0	77.4	0.967	0 2	74.7	0.938	77.0	0.967	0 4	74.7	0.938
1.5	74.3	0.926	0 3	69.8	0.864	73.6	0.928	0 6	69.7	0.864
2.0	70.8	0.870	0 4	63.6	0.766	69.8	0.874	0 8	63.6	0.765
2.5	66.8	0.801	0 5	55.6	0.652	65.6	0.807	0 10	55.5	0.651
3.0	62.0	0.721	0 6	43.9	0.532	60.4	0.730	0 12	43.7	0.532
3.5	55.8	0.634	0 7	25.9	0.428	54.0	0.647	0 14	25.7	0.427
4.0	47.7	0.544	0 8	359.7	0.372	45.6	0.562	0 16	359.4	0.372
4.5	36.5	0.460	0 9	331.1	0.395	34.4	0.482	0 18	330.8	0.396
5.0	20.7	0.391	0 10	309.4	0.482	19.1	0.418	0 20	309.3	0.484
5.5	0.1	0.355	0 11	295.4	0.598	359.9	0.384	0 22	295.3	0.600
6.0	337.9	0.363	0 12	286.0	0.717	339.4	0.392	1 0	285.9	0.719
6.5	319.0	0.414	0 13	279.1	0.823	321.4	0.437	1 2	279.0	0.825
7.0	305.1	0.491	0 14	273.7	0.908	307.7	0.508	1 4	273.6	0.910
7.5	295.2	0.579	0 15	269.1	0.968	297.5	0.591	1 6	269.1	0.968
8.0	288.0	0.668	0 16	265.0	0.997	289.9	0.676	1 8	264.9	0.997
8.5	282.4	0.753	0 17	260.9	0.995	284.0	0.758	1 10	260.8	0.994
9.0	277.9	0.829	0 18	256.7	0.962	279.2	0.831	1 12	256.6	0.961
9.5	274.1	0.893	0 19	252.0	0.900	275.1	0.834	1 14	251.9	0.898
10.0	270.8	0.943	0 20	246.5	0.812	271.6	0.943	1 16	246.3	0.809
10.5	267.8	0.978	0 21	239.5	0.704	268.3	0.978	1 18	239.2	0.701
11.0	264.9	0.997	0 22	229.6	0.585	265.2	0.995	1 20	229.3	0.582
11.5	262.1	0.999	0 23	214.8	0.470	262.1	0.999	1 22	214.2	0.468
12.0	259.2	0.984	1 0	192.2	0.388	259.0	0.985	2 0	191.3	0.387
12.5	256.3	0.953	1 1	163.3	0.374	255.8	0.955	2 2	162.4	0.376
13.0	253.0	0.906	1 2	138.0	0.438	252.3	0.910	2 4	137.3	0.442
13.5	249.4	0.845	1 3	120.9	0.546	248.4	0.852	2 6	120.4	0.550
14.0	245.1	0.772	1 4	109.7	0.665	243.9	0.781	2 8	109.4	0.670
14.5	239.8	0.689	1 5	101.9	0.778	238.4	0.702	2 10	101.7	0.782
15.0	233.0	0.600	1 6	96.0	0.874	231.4	0.617	2 12	95.8	0.877
15.5	223.9	0.511	1 7	91.1	0.945	222.1	0.533	2 14	90.9	0.947
16.0	211.1	0.431	1 8	86.8	0.988	209.6	0.457	2 16	86.6	0.989
16.5	193.3	0.372	1 9	82.7	1.000	192.9	0.402	2 18	82.5	1.000
17.0	171.5	0.352	1 10			172.8	0.382			
17.5	150.1	0.379	1 11			152.7	0.404			
18.0	133.1	0.441	1 12			136.2	0.460			
18.5	121.0	0.524	1 13			123.8	0.536			
19.0	112.2	0.613	1 14			114.7	0.620			
19.5	105.7	0.701	1 15			107.8	0.705			
20.0	100.6	0.783	1 16			102.3	0.784			
20.5	96.4	0.854	1 17			97.7	0.854			
21.0	92.8	0.914	1 18			93.8	0.912			
21.5	89.6	0.958	1 19			90.4	0.957			
22.0	86.7	0.987	1 20			87.2	0.986			
22.5	83.8	1.000	1 21			84.1	0.999			
23.0	81.0	0.995	1 22			81.1	0.996			

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = F \frac{a(p)}{p}$.

Time from Eastern Elongation.	Rhea.		Time from Eastern Elongation.	Titan.		Hyperion.		Time from Eastern Elongation.	Iapetus.	
	p^1	F		p^1	F	p^1	F		p^1	F
d h	.		d h	.		.		d	.	
0 0	83.2	1.000	0 0	83.2	0.994	83.2	1.007	0	84.5	1.025
0 3	79.4	0.987	0 10	79.6	0.978	80.6	1.010	2	83.4	1.011
0 6	75.4	0.949	0 20	75.9	0.938	78.0	1.000	4	82.2	0.974
0 9	71.0	0.887	1 6	71.7	0.876	75.3	0.978	6	80.8	0.913
0 12	65.8	0.804	1 16	66.8	0.795	72.4	0.945	8	79.2	0.832
0 15	59.3	0.706	2 2	60.6	0.698	69.3	0.901	10	77.3	0.782
0 18	50.4	0.599	2 12	52.3	0.592	65.9	0.849	12	74.6	0.614
0 21	37.8	0.494	2 22	40.3	0.487	61.9	0.789	14	70.6	0.484
1 0	19.1	0.410	3 8	22.4	0.399	57.3	0.723	16	63.5	0.345
1 3	354.1	0.375	3 18	357.8	0.357	51.7	0.654	18	46.8	0.210
1 6	328.8	0.405	4 4	331.4	0.379	44.8	0.584	20	357.2	0.130
1 9	309.7	0.487	4 14	311.2	0.456	36.0	0.518	22	304.1	0.200
1 12	296.6	0.591	5 0	297.6	0.559	24.9	0.461	24	286.0	0.333
1 15	287.6	0.699	5 10	288.3	0.666	11.1	0.419	26	278.4	0.471
1 18	280.9	0.798	5 20	281.6	0.767	355.3	0.402	28	274.2	0.601
1 21	275.7	0.882	6 6	276.4	0.855	339.2	0.412	30	271.4	0.717
2 0	271.2	0.945	6 16	272.0	0.925	324.6	0.447	32	269.4	0.812
2 3	267.2	0.985	7 2	268.2	0.974	312.7	0.499	34	267.8	0.891
2 6	263.4	1.000	7 12	264.7	1.001	303.8	0.563	36	266.4	0.944
2 9	259.7	0.989	7 22	261.3	1.003	295.9	0.632	38	265.1	0.971
2 12	255.7	0.952	8 8	257.8	0.964	289.9	0.701	40	263.8	0.972
2 15	251.4	0.892	8 18	254.1	0.943	285.0	0.767	42	262.5	0.948
2 18	246.2	0.811	9 4	250.0	0.881	280.8	0.827	44	261.2	0.899
2 21	239.8	0.713	9 14	245.1	0.803	277.2	0.880	46	259.6	0.827
3 0	231.2	0.606	10 0	239.1	0.712	273.9	0.923	48	257.6	0.734
3 3	218.8	0.500	10 10	231.2	0.613	271.0	0.956	50	255.0	0.623
3 6	200.6	0.414	10 20	220.2	0.515	268.1	0.977	52	251.2	0.499
3 9	176.0	0.375	11 6	204.6	0.431	265.4	0.985	54	244.7	0.365
3 12	150.4	0.401	11 16	183.3	0.382	262.6	0.980	56	230.6	0.233
3 15	130.8	0.480	12 2	159.4	0.387	259.8	0.962	58	190.6	0.138
3 18	117.4	0.583	12 12	138.8	0.442	256.9	0.929	60	133.0	0.178
3 21	108.2	0.691	12 22	124.0	0.529	253.7	0.884	62	110.0	0.300
4 0	101.4	0.791	13 8	113.5	0.628	250.1	0.826	64	100.9	0.435
4 3	96.0	0.876	13 18	106.0	0.725	245.8	0.757	66	96.1	0.566
4 6	91.5	0.942	14 4	100.2	0.814	240.7	0.679	68	93.0	0.686
4 9	87.5	0.983	14 14	95.4	0.889	234.2	0.595	70	90.8	0.792
4 12	83.7	1.000	15 0	91.3	0.945	225.4	0.510	72	89.1	0.880
4 15	79.9	0.990	15 10	87.6	0.981	213.2	0.431	74	87.7	0.949
			15 20	84.1	0.995	196.8	0.373	76	86.4	0.996
			16 6	80.6	0.984	176.0	0.355	78	85.3	1.021
			16 16			154.5	0.363	80	84.1	1.023
			17 2			136.8	0.417			
			17 12			123.9	0.492			
			17 22			114.5	0.576			
			18 8			107.6	0.662			
			18 18			102.2	0.742			
			19 4			97.8	0.816			
			19 14			94.2	0.879			
			20 0			90.9	0.930			
			20 10			88.0	0.969			
			20 20			85.3	0.995			
			21 6			82.6	1.008			

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = F \frac{a(p)}{p}$.

SATELLITES OF SATURN, 1917.

FOR GREENWICH MEAN MIDNIGHT.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$
	°	"	°	"	°	"	°	"
Jan. 1	+0.5	31.5	-0.5	40.4	+0.4	50.0	-0.6	64.1
6	0.7	31.6	0.5	40.5	0.4	50.2	0.6	64.3
11	0.8	31.6	0.5	40.6	0.3	50.3	0.6	64.4
16	0.8	31.7	0.5	40.6	0.3	50.3	0.6	64.4
21	0.9	31.7	0.5	40.6	0.3	50.3	0.6	64.4
26	+1.0	31.6	-0.5	40.6	+0.3	50.2	-0.6	64.3
31	1.1	31.5	0.5	40.5	0.3	50.1	0.6	64.1
Feb. 5	1.2	31.4	0.5	40.3	0.3	49.9	0.6	63.9
10	1.2	31.3	0.5	40.2	0.3	49.7	0.5	63.7
15	1.2	31.2	0.5	40.0	0.3	49.5	0.5	63.4
20	+1.3	31.0	-0.5	39.7	+0.3	49.2	-0.5	63.0
25	1.3	30.8	0.5	39.5	0.3	48.9	0.5	62.6
Mar. 2	1.3	30.6	0.5	39.2	0.3	48.5	0.5	62.1
7	1.3	30.3	0.5	38.9	0.3	48.2	0.5	61.7
12	1.2	30.1	0.5	38.6	0.2	47.8	0.5	61.2
17	+1.2	29.8	-0.5	38.3	+0.2	47.4	-0.5	60.7
22	1.2	29.6	0.5	37.9	0.2	46.9	0.5	60.1
27	1.1	29.3	0.5	37.6	0.2	46.5	0.5	59.6
Apr. 1	1.0	29.0	0.4	37.2	0.2	46.1	0.5	59.0
6	0.9	28.8	0.4	36.9	0.2	45.7	0.5	58.5
11	+0.8	28.5	-0.5	36.6	+0.1	45.3	-0.5	58.0
16	0.7	28.2	0.5	36.2	0.1	44.8	0.5	57.4
21	0.6	28.0	0.5	35.9	0.1	44.4	0.5	56.9
26	0.5	27.7	0.5	35.6	+0.1	44.0	0.5	56.4
May 1	0.3	27.5	0.5	35.3	0.0	43.7	0.5	55.9
6	+0.2	27.3	-0.5	35.0	0.0	43.3	-0.5	55.4
11	0.0	27.0	-0.5	34.7	0.0	42.9	-0.6	55.0
16	...	...	...	...	...	...	...	...
Oct. 7	-1.1	26.8	-0.2	34.4	-0.7	42.6	-0.3	54.6
12	1.0	27.0	0.2	34.7	0.7	42.9	0.3	55.0
17	-0.8	27.3	-0.2	35.0	-0.7	43.3	-0.3	55.4
22	0.6	27.5	0.2	35.3	0.7	43.7	0.3	55.9
27	0.5	27.7	0.2	35.6	0.7	44.0	0.3	56.4
Nov. 1	0.3	28.0	0.2	35.9	0.8	44.4	0.3	56.9
6	-0.2	28.2	0.2	36.2	0.8	44.8	0.2	57.4
11	0.0	28.5	-0.2	36.6	-0.8	45.3	-0.2	58.0
16	+0.2	28.8	0.2	36.9	0.8	45.7	0.2	58.5
21	0.3	29.0	0.2	37.2	0.8	46.1	0.2	59.0
26	0.4	29.3	0.2	37.6	0.8	46.5	0.2	59.6
Dec. 1	0.6	29.5	0.2	37.9	0.8	46.9	0.2	60.1
6	+0.7	29.8	-0.2	38.2	-0.8	47.3	-0.2	60.6
11	0.8	30.0	0.2	38.5	0.9	47.7	0.2	61.1
16	0.9	30.3	0.2	38.8	0.9	48.1	0.3	61.6
21	1.0	30.5	0.2	39.1	0.9	48.4	0.3	62.0
26	1.1	30.7	0.2	39.4	0.9	48.7	0.3	62.4
31	+1.1	30.9	-0.2	39.6	-1.0	49.0	-0.3	62.8

FOR GREENWICH MEAN MIDNIGHT.

Date.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$
	°	"	°	"	°	"	°	"
Jan. 1	-0.3	89.5	-0.1	208	+0.2	251	+0.3	605
6	0.3	89.7	0.1	208	0.2	252	0.2	606
11	0.3	89.9	0.1	208	0.2	252	+0.1	607
16	0.3	90.0	0.1	208	0.2	253	0.0	608
21	0.3	89.9	0.1	208	0.2	252	-0.1	607
26	-0.3	89.8	-0.1	208	+0.3	252	-0.2	607
31	0.3	89.6	0.1	208	0.3	252	0.3	605
Feb. 5	0.3	89.3	0.1	207	0.3	251	0.4	603
10	0.3	88.9	0.1	206	0.3	250	0.4	601
15	0.3	88.5	0.1	205	0.3	248	0.5	598
20	-0.3	88.0	-0.1	204	+0.3	247	-0.6	594
25	0.3	87.4	0.1	203	0.3	246	0.6	591
Mar. 2	0.3	86.8	0.1	201	0.3	244	0.7	586
7	0.3	86.1	0.1	200	0.3	242	0.8	582
12	0.3	85.4	0.1	198	0.3	240	0.8	577
17	-0.3	84.7	-0.1	196	+0.3	238	-0.8	572
22	0.3	84.0	0.1	195	0.3	236	0.8	567
27	0.3	83.2	0.1	193	0.3	234	0.8	562
Apr. 1	0.3	82.4	0.1	191	0.3	232	0.8	557
6	0.3	81.7	0.1	189	0.3	230	0.8	552
11	-0.3	80.9	-0.1	188	+0.3	227	-0.8	547
16	0.3	80.2	0.1	186	0.3	225	0.7	542
21	0.3	79.5	0.1	184	0.3	223	0.7	537
26	0.3	78.8	0.1	183	0.3	221	0.6	532
May 1	0.3	78.1	0.1	181	0.3	219	0.5	528
6	-0.3	77.4	-0.1	180	+0.3	218	-0.4	523
11	-0.3	76.8	-0.1	178	+0.2	216	-0.4	519
Oct. ..	...	...	...	...	...	...	...	...
7	-0.2	76.2	+0.2	177	+0.4	214	+3.9	515
12	0.2	76.8	0.2	178	0.4	216	4.0	519
17	-0.2	77.4	+0.2	180	+0.4	218	+4.1	523
22	0.2	78.1	0.2	181	0.4	219	4.1	528
27	0.2	78.8	0.2	183	0.4	221	4.2	532
Nov. 1	0.2	79.5	0.2	184	0.4	223	4.3	537
6	0.2	80.2	0.2	186	0.4	225	4.3	542
11	-0.2	80.9	+0.2	188	+0.4	227	+4.4	547
16	0.2	81.7	0.2	189	0.4	230	4.4	552
21	0.2	82.4	0.2	191	0.4	232	4.4	557
26	0.2	83.2	0.2	193	0.4	234	4.4	562
Dec. 1	0.2	83.9	0.2	194	0.4	236	4.4	567
6	-0.2	84.6	+0.2	196	+0.4	238	+4.4	572
11	0.2	85.3	0.2	198	0.4	240	4.4	576
16	0.2	86.0	0.2	199	0.4	242	4.3	581
21	0.2	86.6	0.2	201	0.4	243	4.3	585
26	0.2	87.2	0.2	202	0.4	245	4.2	589
31	-0.2	87.7	+0.2	203	+0.4	246	+4.1	592

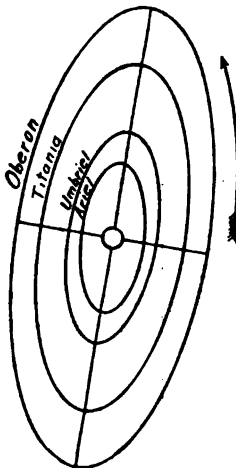
668 SATELLITES OF URANUS, 1917.

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION,
AUGUST 14, 1917, AS SEEN IN AN INVERTING TELESCOPE.

South

Apparent Apisdes.

Date.	Position Angle.	App. Distances..	
		Ariel.	Umbriel.
May 7	•	"	"
Aug. 15	349.6	13.2	18.4
Nov. 23	350.2	13.9	19.4
	350.8	13.1	18.3



Apparent Apisdes.

Date.	Position Angle.	App. Distances..	
		Titania.	Oberon.
May 7	•	"	"
Aug. 15	349.6	30.1	40.3
Nov. 23	350.2	31.9	42.6
	350.8	30.0	40.1

North

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
May 16 9.4	May 20 4.1	May 8 4.7	May 10 6.4	May 8 10.9	May 12 19.3	May 28 23.5 N.
23 22.8	27 17.5	16 11.6	18 13.3	17 3 8	21 12.2	June 4 17.1 S.
31 12.3	June 4 7.0	24 18.5	26 20.2	25 20.7	30 5.1	11 10 6 N.
June 8 1.7	11 20.4	June 2 1.4	June 4 3.1	June 3 13.6	June 7 22.1	18 4.2 S.
15 15.2	19 9.9	10 8.3	12 10.0	12 6.5	16 15.0	24 21.8 N.
23 4.6	26 23.4	18 15.2	20 17.0	20 23.5	25 8.0	July 1 15.3 S.
30 18.1	July 4 12.8	26 22.1	28 23.9	29 16.4	July 4 0.9	8 8.9 N.
July 8 7.6	12 2.3	July 5 5.1	July 7 6.8	July 8 9.4	12 17.9	15 2.5 S.
15 21.0	19 15.8	13 12.0	15 13.7	17 2.4	21 10.8	21 20.1 N.
23 10.5	27 5.2	21 18.9	23 20.6	25 19.3	30 3.8	28 13.7 S.
31 0.0	Aug. 3 18.7	30 1 8	Aug. 1 3.6	Aug. 3 12.3	Aug. 7 20.8	Aug. 4 7.3 N.
Aug. 7 13.4	11 8.2	Aug. 7 8.8	9 10.5	12 5.2	16 13.7	11 0.9 S.
15 2.9	18 21.6	15 15.7	17 17.4	20 22.2	25 6.7	17 18.5 N.
22 16.4	26 11.1	23 22.6	26 0.4	29 15.2	Sept. 2 23.7	24 12.1 S.
30 5.9	Sept. 3 0.6	Sept. 1 5.6	Sept. 3 7.3	Sept. 7 8.2	11 16.7	31 5.7 N.
Sept. 6 19.3	10 14.1	9 12.5	11 14.2	16 1.2	20 9.6	Sept. 6 23.3 S.
14 8.8	18 3.6	17 19.4	19 21.2	24 18.1	29 2.6	13 16.9 N.
21 22.3	25 17.0	26 2 4	28 4.1	Oct. 8 11.1	Oct. 7 19.6	20 10.5 S.
29 11.8	Oct. 3 6.5	Oct. 4 9.3	6 11.1	12 4.1	16 12.6	27 4.1 N.
Oct. 7 1.3	10 20.0	12 16.3	14 18.0	20 21.0	25 5.5	Oct. 3 21.7 S.
14 14.8	18 9.5	20 23.2	23 1.0	29 14.0	Nov. 2 22.5	10 15.2 N.
22 4.2	25 23.0	29 6.2	31 7.9	Nov. 7 7.0	11 15.4	17 8.8 S.
29 17.7	Nov. 2 12.5	Nov. 6 13.1	8 14.8	15 23.9	20 8.4	24 2.4 N.
Nov. 6 7.2	10 1.9	14 20.0	16 21.8	24 16.9	29 1.3	30 20.0 S.
13 20.7	17 15.4	23 3 0	25 4.7	Dec. 3 9.8	Dec. 7 18.3	Nov. 6 13.6 N.

In the above diagram the central circle represents the planet.

For Ariel every third greatest elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Ariel, 2^d 12^h.489; of Umbriel, 4^d 3^h.460; of Titania, 8^d 16^h.941; of Oberon, 13^d 11^h.118.

Time from Northern Elongation.	Ariel.		Umbriel.		Time from Northern Elongation.	Titania.		Time from Northern Elongation.	Oberon.	
	p^1	F	p^1	F		p^1	F		p^1	F
d h	.		.		d h	.		d h	.	
0 0	350.2	1.000	350.2	1.000	0 0	350.2	1.000	0 0	350.2	1.000
0 2	355.2	0.982	353.2	0.993	0 5	353.8	0.991	0 8	354.0	0.990
0 4	0.6	0.930	356.3	0.974	0 10	357.6	0.963	0 16	357.8	0.960
0 6	6.8	0.847	359.6	0.942	0 15	1.6	0.918	1 0	2.0	0.912
0 8	14.6	0.741	3.2	0.898	0 20	6.1	0.857	1 8	6.8	0.848
0 10	25.4	0.621	7.1	0.843	1 1	11.4	0.783	1 16	12.5	0.770
0 12	41.2	0.507	11.7	0.780	1 6	17.9	0.700	2 0	19.5	0.682
0 14	64.5	0.429	17.1	0.711	1 11	26.3	0.613	2 8	28.7	0.592
0 16	92.6	0.423	23.7	0.637	1 16	37.3	0.529	2 16	41.0	0.507
0 18	116.8	0.494	32.1	0.564	1 21	52.2	0.459	3 0	57.7	0.443
0 20	133.4	0.606	42.8	0.498	2 2	71.0	0.420	3 8	78.1	0.416
0 22	144.6	0.726	56.4	0.447	2 7	91.6	0.422	3 16	99.0	0.434
1 0	152.8	0.835	72.7	0.418	2 12	110.0	0.466	4 0	116.5	0.493
1 2	159.1	0.922	90.0	0.420	2 17	124.4	0.537	4 8	129.6	0.575
1 4	164.6	0.978	106.0	0.452	2 22	135.2	0.622	4 16	139.4	0.665
1 6	169.6	1.000	119.2	0.507	3 3	143.2	0.710	5 0	146.7	0.758
1 8	174.6	0.986	129.6	0.574	3 8	149.6	0.792	5 8	152.6	0.833
1 10	179.9	0.938	137.7	0.647	3 13	154.8	0.864	5 16	157.5	0.901
1 12	186.0	0.859	144.1	0.720	3 18	159.3	0.924	6 0	161.8	0.953
1 14	193.6	0.755	149.4	0.789	3 23	163.3	0.967	6 8	165.8	0.986
1 16	203.9	0.636	153.9	0.851	4 4	167.0	0.993	6 16	169.5	1.000
1 18	218.9	0.519	157.8	0.904	4 9	170.6	1.000	7 0	173.2	0.994
1 20	241.2	0.435	161.3	0.947	4 14	174.2	0.989	7 8	177.0	0.968
1 22	269.2	0.419	164.5	0.977	4 19	178.0	0.959	7 16	181.2	0.923
2 0	294.2	0.482	167.6	0.995	5 0	182.0	0.912	8 0	185.8	0.862
2 2	311.7	0.591	170.6	1.000	5 5	186.6	0.850	8 8	191.3	0.786
2 4	323.5	0.712	173.6	0.992	5 10	192.1	0.775	8 16	198.0	0.700
2 6	331.9	0.823	176.8	0.970	5 15	198.7	0.691	9 0	206.7	0.609
2 8	338.4	0.913	180.1	0.936	5 20	207.3	0.604	9 8	218.3	0.523
2 10	344.0	0.972	183.7	0.891	6 1	218.7	0.520	9 16	234.1	0.453
2 12	349.0	0.999	187.7	0.835	6 6	234.0	0.454	10 0	253.9	0.418
2 14	354.0	0.990	192.4	0.771	6 11	253.2	0.418	10 8	275.1	0.427
2 16			197.9	0.701	6 16	273.7	0.425	10 16	293.4	0.479
2 18			204.7	0.627	6 21	291.8	0.472	11 0	307.4	0.557
2 20			213.4	0.555	7 2	305.7	0.546	11 8	317.6	0.647
2 22			224.5	0.490	7 7	316.1	0.632	11 16	325.4	0.736
3 0			238.5	0.441	7 12	324.0	0.718	12 0	331.6	0.819
3 2			255.0	0.417	7 17	330.2	0.800	12 8	336.6	0.889
3 4			272.3	0.423	7 22	335.3	0.871	12 16	341.0	0.944
3 6			288.0	0.458	8 3	339.7	0.929	13 0	345.0	0.981
3 8			300.8	0.515	8 8	343.7	0.970	13 8	348.8	0.998
3 10			310.8	0.584	8 13	347.4	0.994	13 16	352.5	0.996
3 12			318.6	0.657	8 18	351.0	1.000			
3 14			324.9	0.730						
3 16			330.0	0.798						
3 18			334.4	0.859						
3 20			338.3	0.911						
3 22			341.7	0.952						
4 0			345.0	0.980						
4 2			348.0	0.997						
4 4			351.0	1.000						

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $= \frac{r^2(p)}{p}$.

SATELLITES OF URANUS, 1917.

FOR GREENWICH MEAN NOON.

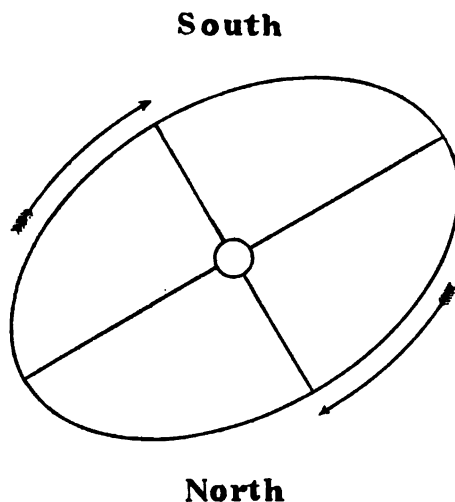
Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$				Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
Apr. 20	•	"	"	"	"	Aug. 18	•	"	"	"	"
25	-0.4	13.0	18.1	29.7	39.7	23	+0.1	13.9	19.4	31.9	42.6
30	0.5	13.0	18.2	29.8	39.9	28	0.2	13.9	19.4	31.8	42.6
May 5	0.5	13.1	18.2	29.9	40.0	Sept. 2	0.2	13.9	19.4	31.8	42.5
10	0.6	13.2	18.3	30.1	40.2	7	0.3	13.9	19.3	31.7	42.4
15	0.6	13.2	18.4	30.2	40.4	12	+0.4	13.8	19.3	31.6	42.3
20	-0.6	13.3	18.5	30.3	40.5	17	0.4	13.8	19.2	31.6	42.2
25	0.6	13.3	18.6	30.4	40.7	22	0.5	13.8	19.2	31.5	42.1
30	0.6	13.4	18.6	30.6	40.9	27	0.5	13.7	19.1	31.4	42.0
June 4	0.6	13.4	18.7	30.7	41.0	Oct. 2	0.6	13.7	19.1	31.3	41.9
9	0.6	13.5	18.8	30.8	41.2	7	+0.6	13.6	19.0	31.2	41.7
14	-0.6	13.5	18.9	30.9	41.4	12	0.6	13.6	18.9	31.1	41.6
19	0.6	13.6	18.9	31.0	41.5	17	0.6	13.5	18.9	31.0	41.4
24	0.6	13.6	19.0	31.2	41.7	22	0.6	13.5	18.8	30.8	41.2
29	0.6	13.7	19.1	31.3	41.8	27	0.6	13.4	18.7	30.7	41.1
July 4	0.5	13.7	19.1	31.4	42.0	Nov. 1	+0.6	13.4	18.6	30.6	40.9
9	-0.5	13.8	19.2	31.5	42.1	6	0.6	13.3	18.6	30.4	40.7
14	0.4	13.8	19.2	31.6	42.2	11	0.6	13.3	18.5	30.3	40.5
19	0.4	13.8	19.3	31.6	42.3	16	0.6	13.2	18.4	30.2	40.4
24	0.3	13.9	19.3	31.7	42.4	21	0.6	13.1	18.3	30.0	40.2
29	0.3	13.9	19.4	31.8	42.5	26	+0.5	13.1	18.2	29.9	40.0
Aug. 3	-0.2	13.9	19.4	31.8	42.5	Dec. 1	0.5	13.0	18.2	29.8	39.9
8	0.2	13.9	19.4	31.8	42.6	6	0.4	13.0	18.1	29.7	39.7
13	-0.1	13.9	19.4	31.8	42.6	11	+0.4	12.9	18.0	29.6	39.6
	0.0	13.9	19.4	31.9	42.6						

SATELLITE OF NEPTUNE, 1917.

Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F	Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{\alpha(\rho)}{\rho}$
d h	•		d h	•		Jan. 1	+0.7	16.8	May 1	-1.5	16.2
0 0	120.1	1.000	3 0	297.8	0.999	6	0.5	16.8	6	1.4	16.1
0 3	115.3	0.995	3 3	292.8	0.988	11	0.4	16.8	11	1.4	16.1
0 6	110.3	0.979	3 6	287.8	0.967	16	0.2	16.8	16	1.3	16.0
0 9	105.1	0.953	3 9	282.4	0.937	21	+0.1	16.8	21	-1.2	16.0
0 12	99.6	0.918	3 12	276.7	0.899	26	-0.1	16.8	Oct. 2	+3.5	16.0
0 15	93.6	0.877	3 15	270.4	0.855	31	0.2	16.8	7	3.6	16.0
0 18	86.9	0.831	3 18	263.4	0.807	Feb. 5	0.4	16.8	12	3.6	16.1
0 21	79.5	0.782	3 21	255.4	0.758	10	0.6	16.8	17	3.7	16.1
1 0	71.0	0.734	4 0	246.4	0.712	15	0.7	16.8	22	3.8	16.2
1 3	61.5	0.692	4 3	236.4	0.674	20	-0.8	16.7	27	+3.8	16.2
1 6	50.8	0.658	4 6	225.2	0.646	25	1.0	16.7	Nov. 1	3.9	16.3
1 9	39.2	0.638	4 9	213.3	0.634	Mar. 2	1.1	16.7	6	3.9	16.3
1 12	27.2	0.634	4 12	201.2	0.638	7	1.2	16.6	11	3.9	16.4
1 15	15.3	0.646	4 15	189.6	0.658	12	1.3	16.6	16	3.9	16.4
1 18	4.1	0.673	4 18	179.0	0.691	17	-1.4	16.6	21	+3.8	16.5
1 21	354.0	0.712	4 21	169.4	0.734	22	1.5	16.5	26	3.8	16.5
2 0	345.0	0.758	5 0	160.9	0.781	27	1.5	16.5	Dec. 1	3.8	16.5
2 3	337.0	0.806	5 3	153.4	0.830	Apr. 1	1.6	16.5	6	3.7	16.6
2 6	330.0	0.854	5 6	146.8	0.877	6	1.6	16.4	11	3.6	16.6
2 9	323.7	0.899	5 9	140.8	0.918	11	-1.6	16.4	16	+3.5	16.6
2 12	317.9	0.937	5 12	135.2	0.953	16	1.6	16.3	21	3.4	16.7
2 15	312.6	0.967	5 15	130.0	0.979	21	1.6	16.3	26	3.3	16.7
2 18	307.5	0.988	5 18	125.1	0.994	26	-1.6	16.2	31	+3.2	16.7
2 21	302.6	0.999	5 21	120.2	1.000						

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = \frac{F \alpha(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION,
JANUARY 23, 1917, AS SEEN IN AN INVERTING TELESCOPE.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
Jan. 23	120.1	16.8
May 3	118.7	16.2
Oct. 14	123.8	16.1
Dec. 33	123.2	16.7

GREENWICH MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
	d h		d h		d h		d h		d h		d h
Jan.	2 0.2	Jan.	4 22.8	Mar.	25 7.8	Mar.	28 6.4	Oct.	11 1.2	Oct.	13 23.7
	7 21.3		10 19.9		31 4.9	Apr.	3 3.4		16 22.2		19 20.7
	13 18.5		16 17.0	Apr.	6 2.0		9 0.5		22 19.2		25 17.7
	19 15.6		22 14.1		11 23.0		14 21.6		28 16.2		31 14.7
	25 12.7		28 11.3		17 20.1		20 18.6	Nov.	3 13.2	Nov.	6 11.7
					23 17.1		26 15.7		9 10.3		12 8.8
Feb.	31 9.8	Feb.	3 8.4		29 14.2	May	2 12.7		15 7.3		18 5.8
	6 6.9		9 5.5	May	5 11.2		8 9.7		21 4.3		24 2.9
	12 4.1		15 2.6		11 8.2		14 6.7		27 1.4		29 23.9
	18 1.2		20 23.8		17 5.2		20 3.7	Dec.	2 22.5	Dec.	5 21.0
	23 22.3		26 20.9								
					23 2.2		26 0.7		8 19.5		11 18.1
Mar.	1 19.4	Mar.	4 18.0		28 23.2		31 21.7		14 16.6		17 15.1
	7 16.5		10 15.1						20 13.7		23 12.2
	13 13.6		16 12.2	Oct.	5 4.2	Oct.	8 2.7		26 10.8		29 9.3
	19 10.7		22 9.3								

In the above diagram the central circle represents the planet.
The sidereal period of the satellite of Neptune is $5^d 21^h.044$.

PLANETARY CONFIGURATIONS.

d	h	m			d	h	m		
June 22	0	2	♂	Ψ	Oct. 1	0	0	♂	♂ + 0 40
22	21	-	♂	in Ω	2	18	-	♂	in Perihelion.
23	19	-	♂	in Perihelion.	4	4	-	♂	Greatest elong. W. 17 56
July 2	4	-	♂	in Ω	4	21	27	♂	♂ - 2 57
3	8	-	♂	in Aphelion.	9	8	54	♂	♂ + 2 36
4	-	-	♂	Tot. ecl. invis. at Wash.	9	21	25	♂	♂ + 3 52
4	12	-	♂	♂ + 1 4	10	7	36	♂	♂ + 5 2
6	11	-	♂	♂ + 1 43	13	1	-	♂	Greatest Hel. Lat. N.
6	18	-	♂	in Perihelion.	14	4	-	♂	in Aphelion.
7	6	14	♂	♂ - 4 41	14	16	37	♂	♂ + 7 33
12	4	-	♂	Superior.	19	7	57	♂	♂ - 0 8
14	9	53	♂	♂ - 4 5	24	15	32	♂	♂ - 4 44
15	12	-	♂	Greatest Hel. Lat. N.	30	4	-	♂	Stationary.
15	20	41	♂	♂ - 1 26	30	14	-	♂	♂ - 2 55
17	1	-	♂	Greatest Hel. Lat. N.	Nov. 1	4	25	♂	♂ - 2 55
18	-	-	♂	Par. ecl. invis. at Wash.	3	6	-	♂	Superior.
18	9	-	♂	♂ + 1 25	5	10	-	♂	Greatest Hel. Lat. S.
18	22	-	♂	♂ + 2 3	5	12	-	♂	in Ω
19	6	48	♂	♂ + 2 33	5	17	16	♂	♂ + 2 53
19	8	52	♂	♂ + 2 1	6	8	32	♂	♂ + 4 19
19	11	9	♂	♂ + 4 11	6	16	-	♂	♂ + 6 46
20	21	12	♂	♂ + 5 23	8	1	37	♂	♂ + 6 46
27	9	-	♂	♂ + 0 39	9	13	-	♂	Stationary.
27	19	-	♂	♂ + 0 39	12	8	-	♂	♂ + 1 48
30	1	-	♂	♂ + 0 39	14	20	50	♂	♂ + 1 48
Aug. 3	14	20	♂	♂ - 4 34	15	17	-	♂	in Aphelion.
9	12	-	♂	in Ω	18	2	46	♂	♂ - 4 4
10	23	51	♂	♂ - 3 39	20	21	43	♂	♂ - 4 56
13	16	0	♂	♂ + 0 42	26	4	-	♂	Stationary.
14	16	-	♂	♂ + 0 42	28	8	30	♂	♂ - 3 7
15	17	3	♂	♂ + 2 7	28	18	-	♂	♂ + 8 0
15	20	18	♂	♂ + 2 55	29	20	-	♂	Greatest elong. E. 47 18
19	18	-	♂	in Aphelion.	3	1	39	♂	♂ + 3 2
19	21	21	♂	♂ + 3 36	3	17	42	♂	♂ + 4 36
20	7	52	♂	♂ + 6 33	6	2	-	♂	Greatest Hel. Lat. S.
22	17	-	♂	Greatest elong. E. 27 23	6	15	37	♂	♂ + 8 0
30	23	28	♂	♂ - 4 30	11	16	-	♂	Ann. ecl. invis. at Wash.
Sept. 2	22	-	♂	Stationary.	13	-	-	♂	♂ - 3 4
4	20	-	♂	♂ - 3 14	15	11	42	♂	Greatest elong. E. 20 20
7	11	47	♂	♂ - 3 14	16	18	-	♂	♂ - 5 30
9	3	-	♂	Greatest Hel. Lat. S.	17	13	1	♂	♂ - 5 5
9	14	-	♂	in Ω	18	4	47	♂	enters ♄, Winter com.
11	11	53	♂	♂ + 2 55	21	21	46	♂	Stationary.
12	0	54	♂	♂ + 2 18	24	11	-	♂	Greatest Hel. Lat. N.
12	9	12	♂	♂ + 3 22	25	0	-	♂	♂ + 3 0
16	9	7	♂	♂ + 1 31	25	2	-	♂	in Ω
18	12	-	♂	Inferior.	25	10	46	♂	♂ - 3 20
19	10	30	♂	♂ + 4 5	27	-	-	♂	Tot. ecl. vis. at Wash.
21	22	-	♂	♂ + 1 18	29	17	-	♂	in Perihelion.
23	3	1	♂	enters ♄, Autumn com.	30	9	13	♂	♂ + 3 0
26	20	-	♂	Stationary.	30	20	-	♂	♂ + 0 35
27	8	14	♂	♂ - 4 33	31	0	4	♂	♂ + 4 37
28	3	-	♂	in Ω	31	17	-	♂	in Ω
30	5	-	♂	Stationary.					

OBSERVATORIES, 1917.

Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log p (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
	° ' "	' "			h m s	s
Abbadia, France . . .	+43 22 52.2	-11 34.4	69	9.999317	+ 0 7 0.1	+ 1.15
Adelaide, S. Australia .	-34 55 38.0 <i>a</i>	+10 52.4	41 <i>b</i>	9.999528	- 9 14 20.07 <i>a</i>	- 91.06
Adelaide, S. Australia .	-34 55 37.4 <i>c</i>	+10 52.4	...	9.999523	- 9 14 20.17 <i>c</i>	- 91.06
Albany, N. Y. . . .	+42 39 12.7 <i>a</i>	-11 33.1	70 <i>a</i>	9.999336	+ 4 55 7.12 <i>a</i>	+ 48.48
Albany, N. Y. . . .	+42 39 49.5 <i>a</i>	-11 33.1	52	9.999335	+ 4 54 59.97 <i>a</i>	+ 48.46
Algiers, Algeria . . .	+36 47 50	-11 6.7	342	9.999501	- 0 12 8.38	- 1.99
Allegheny, Pa. . . .	+40 28 58.1 <i>d</i>	-11 26.7	370 <i>d</i>	9.999411	+ 5 20 5.39 <i>d</i>	+ 52.58
Allegheny, Pa. . . .	+40 27 41.6	-11 26.6	...	9.999387	+ 5 20 2.93	+ 52.58
Amherst, Mass. . . .	+42 21 56.5 <i>e</i>	-11 32.5	110 <i>e</i>	9.999346	+ 4 50 5.93 <i>e</i>	+ 47.66
Amherst, Mass. . . .	+42 22 17.1 <i>f</i>	-11 32.5	...	9.999338	+ 4 50 4.67 <i>f</i>	+ 47.65
Ann Arbor, Mich. . . .	+42 16 48.7 <i>a</i>	-11 32.3	282 <i>a</i>	9.999360	+ 5 34 55.27 <i>a</i>	+ 55.02
Appleton, Wis. . . .	+44 15 39.2 <i>g</i>	-11 35.4	242	9.999307	+ 5 53 35.92 <i>g</i>	+ 58.09
Arcetri, Italy	+43 45 14.4	-11 34.9	184	9.999316	- 0 45 1.30	- 7.40
Arequipa, Peru . . .	-16 22 28.0 <i>h</i>	+ 6 15.2	2451 <i>h</i>	0.000052	+ 4 46 11.73 <i>h</i>	+ 47.02
Armagh, Ireland . . .	+54 21 12.7 <i>c</i>	-10 59.6	61 <i>c</i>	9.999040	+ 0 26 35.4 <i>c</i>	+ 4.37
Athens, Greece . . .	+37 58 19.7 <i>i</i>	-11 14.3	107 <i>i</i>	9.999456	- 1 34 53 <i>i</i>	- 15.59
Baltimore, Md. . . .	+39 17 52.0 <i>j</i>	-11 21.5	36 <i>j</i>	9.999418	+ 5 6 29.1 <i>j</i>	+ 50.35
Bamberg, Bavaria . . .	+49 53 6.0 <i>c</i>	-11 26.0	299 <i>c</i>	9.999167	- 0 43 33.57 <i>c</i>	- 7.16
Barcelona, Spain . . .	+41 25 18	-11 30.0	420	9.999391	- 0 8 28.0	- 1.39
Beloit, Wis.	+42 30 8.4	-11 32.8	...	9.999335	+ 5 56 7.4	+ 58.50
Bergedorf, Germany . .	+53 28 46.2	-11 6.1	35	9.999060	- 0 40 57.74	- 6.73
Berkeley, Cal. . . .	+37 52 23.8	-11 13.7	97	9.999458	+ 8 9 2.72	+ 80.34
Berlin, Prussia	+52 30 16.7 <i>k</i>	-11 12.5	47 <i>k</i>	9.999085	- 0 53 34.80 <i>k</i>	- 8.80
Berlin, Prussia	+52 31 13.1	-11 12.4	...	9.999081	- 0 53 34.41	- 8.80
Berlin, Prussia	+52 31 30.7	-11 12.4	...	9.999081	- 0 53 27.40	- 8.78
Berlin, Prussia	+52 29 7	-11 12.6	38	9.999084	- 0 53 54.2	- 8.86
Berne, Switzerland . .	+46 57 8.7	-11 34.2	573	9.999260	- 0 29 45.70 <i>a</i>	- 4.89
Beaunçon, France . . .	+47 14 59.0	-11 33.7	312	9.999235	- 0 23 57.13	- 3.93
Birr Castle, Ireland . .	+53 5 47	-11 8.7	56	9.999071	+ 0 31 40.9	+ 5.20
Bloomington, Ind. . . .	+39 9 56 <i>d</i>	-11 20.8	238 <i>d</i>	9.999435	+ 5 46 5 <i>d</i>	+ 56.85
Bogota, Colombia . . .	+ 4 35 55.2 <i>c</i>	- 1 50.8	2634	0.000170	+ 4 56 23.5	+ 48.69
Bombay (Colaba), India	+18 53 36.2 <i>c</i>	- 7 5.1	14 <i>c</i>	9.999849	- 4 51 15.72 <i>c</i>	- 47.85
Bonn, Prussia	+50 43 45.0 <i>c</i>	-11 22.3	62 <i>i</i>	9.999130	- 0 28 23.17 <i>k</i>	- 4.66
Bordeaux (Floirac), France	+44 50 7.2 <i>a</i>	-11 35.6	73	9.999281	+ 0 2 5.51 <i>a</i>	+ 0.34
Boston, Mass.	+42 20 58 <i>m</i>	-11 32.5	31 <i>m</i>	9.999341	+ 4 44 19.1 <i>m</i>	+ 46.71
Boston, Mass.	+42 21 32.5	-11 32.5	48	9.999342	+ 4 44 15.0	+ 46.70
Bothkamp, Prussia . . .	+54 12 9.6 <i>n</i>	-11 0.8	32 <i>n</i>	9.999042	- 0 40 31.02 <i>n</i>	- 6.66
Bremen, Germany . . .	+53 4 36	-11 8.8	...	9.999067	- 0 35 15	- 5.79
Breslau, Prussia	+51 6 55.8 <i>k</i>	-11 20.4	147 <i>k</i>	9.999126	- 1 8 8.72 <i>k</i>	- 11.20
Brisbane, Queensland . .	-27 28 0.0	+ 9 28.3	...	9.999691	-10 12 6.17	-100.55
Brussels (Uccle), Belgium	+50 47 55.5 <i>a</i>	-11 21.9	105 <i>a</i>	9.999131	- 0 17 26.05 <i>a</i>	- 2.86
Brussels, Belgium . . .	+50 51 10.6 <i>c</i>	-11 21.7	...	9.999123	- 0 17 28.02 <i>c</i>	- 2.87
Budapest, Hungary . . .	+47 29 34.7 <i>c</i>	-11 33.2	131 <i>c</i>	9.999217	- 1 16 15.3 <i>c</i>	- 12.53
Cambridge, England . . .	+52 12 51.6	-11 14.8	28	9.999091	- 0 0 22.75	- 0.06
Cambridge, Mass. . . .	+42 22 47.6 <i>o</i>	-11 32.6	24	9.999340	+ 4 44 31.05 <i>o</i>	+ 46.74
Cape of Good Hope . . .	-33 56 3.5 <i>p</i>	+10 43.6	13 <i>p</i>	9.999548	- 1 13 54.76 <i>p</i>	- 12.14
Carloforte, Sardinia . .	+39 8 8.9 <i>q</i>	-11 20.7	18 <i>q</i>	9.999421	- 0 33 14.9 <i>q</i>	- 5.46
Catania, Sicily	+37 30 13.2 <i>c</i>	-11 11.4	49 <i>c</i>	9.999464	- 1 0 20.70	- 9.91
Charkow, Russia	+50 0 9.9 <i>a</i>	-11 25.5	138 <i>r</i>	9.999153	- 2 24 55.75 <i>a</i>	- 23.81
Charlottesville, Va. . . .	+38 2 1.2 <i>e</i>	-11 14.6	259 <i>e</i>	9.999465	+ 5 14 5.33 <i>e</i>	+ 51.60

meridian circle.
 standard barometer.
 transit instrument.
 transit instrument pier.
 center of large dome.
 center of dome tower.

s Center of dome.
A Transit pier.
c Circle Syngros.
f Center of instrument house.
k Center of observatory.
i Floor of meridian room.

m Foot of pillar of 7-in. equatorial.
n Cube of equatorial.
o Dome of 15-in. equatorial.
p 8-in. meridian circle.
q Zenith telescope.
r Barometer in meridian room.

No.	Authority for—		Description.
	Latitude.	Longitude.	
1	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Obs. Paris Acad. of Sci., Hendaye.
2	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., since 1884.
3	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., before 1884.
4	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., since 1893.
5	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., before 1893.
6	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	At Bouzaréah. Old Obs. 3° 58' S., 8° E.
7	<i>Publications of Obs.</i> , 1909.	<i>Publications of Obs.</i> , 1909.	• Obs. Western Univ. of Pa., since 1905.
8	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Western Univ. of Pa., before 1905.
9	Letter from Director, 1913.	Letter from Director, 1913.	Amherst College Obs., since 1903.
10	Letter from Director, 1913.	Letter from Director, 1913.	Lawrence Obs., before 1903.
11	Letter from Director, 1913.	Letter from Director, 1913.	Detroit Obs., Univ. of Mich.
12	See footnote (b).	See footnote (b).	Underwood Obs., Lawrence College.
13	<i>Pubbl. dell'Osserv.</i> , 1900.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.
14	<i>Harvard Annals</i> , 1903.	<i>Harvard Annals</i> , 1903.	Branch of Harvard Coll. Obs.
15	<i>Armagh Catalogue of Stars</i> , 1840.	<i>Armagh Catalogue of Stars</i> , 1840.	Armagh Observatory.
16	<i>Annales de l'Obs.</i> , 1910.	Letter from Director, 1913.	• National Observatory.
17	Letter from Director, 1913.	Letter from Director, 1913.	Johns Hopkins Univ. Obs.
18	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Remeis Observatory.
19	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Fabra Obs., Acad. of Sci. and Arts.
20	Letter from Director, 1897.	Letter from Director, 1897.	Smith Obs., Beloit College.
21	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Hamburg Obs., since 1909.
22	Letter from Director, 1897.	Letter from Director, 1897.	Students' Obs., Univ. of Cal.
23	<i>Astron. Nach.</i> , Nr. 3545, 1898.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Obs., since 1835.
24	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., before 1835.
25	<i>Astron. Nach.</i> , Nr. 3170, 1893.	<i>Astron. Nach.</i> , Nr. 3170, 1893.	Urania Observatory.
26	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Treptow Observatory.
27	<i>Berliner Jahrbuch</i> .	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Observatory, Cantonal Univ.
28	<i>Astron. Nach.</i> , Nr. 2805, 1887.	<i>Astron. Nach.</i> , Nr. 2805, 1887.	National Observatory.
29	<i>British Nautical Almanac</i> .	<i>British Nautical Almanac</i> .	Private Obs. of Earl of Rosse.
30	Letter from Director, 1913.	Letter from Director, 1913.	Kirkwood Obs., Univ. of Ind.
31	Letter from Director, 1913.	Letter from Director, 1913.	National Observatory.
32	Letter from Director, 1913.	Letter from Director, 1913.	Government Observatory.
33	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.
34	Letter from Director, 1897.	<i>Annales de l'Obs.</i> , 1885.	Obs., Univ. of Bordeaux.
35	Letter from Director, 1909.	Letter from Director, 1909.	Boston Univ. Obs., since 1909.
36	Letter from Director, 1895.	Letter from Director, 1895.	Boston Univ. Obs., before 1909.
37	<i>Beob. zu Bothkamp</i> , 1872.	Letter from Director, 1913.	Obs. of Herr von Bülow.
38	<i>Astron. Nach.</i> , Nr. 15, 1822.	<i>Astron. Nach.</i> , Nr. 15, 1822.	Formerly Olber's Obs.
39	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
40	<i>British Nautical Almanac</i> .	• <i>British Nautical Almanac</i> .	Brisbane Observatory.
41	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., since 1891.
42	<i>Annales de l'Obs.</i> , 1857.	Letter from Director, 1913.	Royal Obs., before 1891.
43	<i>Astron. Nach.</i> , Nr. 2752, 1886.	<i>Astron. Nach.</i> , Nr. 2752, 1886.	University Observatory.
44	Letter from Director, 1879.	Letter from Director, 1879.	University Observatory.
45	<i>Harvard Annals</i> , 1887.	<i>U. S. C. and G. S. Report</i> , 1897.	Harvard College Obs.
46	<i>Cape Gen. Catalogue of Stars</i> , 1855.	<i>Monthly Notices, R. A. S.</i> , Nov. 1908.	Royal Observatory.
47	See footnote (d).	Letter from Director, 1913.	International Lat. Obs.
48	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs. of Catania and Bina.
49	<i>Annales de l'Obs.</i> , 1904.	<i>Annales de l'Obs.</i> , 1904.	University Observatory.
50	Letter from Director, 1913.	Letter from Director, 1913.	Leander McCormick Obs., Univ. Va.

• Name of Western Univ. of Pa. changed in 1906; now the Univ. of Pittsburgh.

• *Professional Papers, Corps of Engineers, U. S. A.*, 1882.

• Old meridian circle 0° 43', 0.1 W. of Circle Synod.

• *Resultats des Internationalen Breitenbestimmungen, 1900-1908.*

• With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		° ' "	' "			h m s	s
51	Chicago, Ill.	+41 50 1.0	-11 31.2	...	9.999352	+5 50 26.84	+57.57
52	Christiania, Norway . . .	+59 54 44.0 ^a	-10 4.6	25 ^a	9.998908	-0 42 53.50 ^a	- 7.06
53	Cincinnati, Ohio . . .	+39 8 19.8 ^b	-11 20.7	247 ^b	9.999437	+5 37 41.40 ^b	+55.48
54	Cincinnati, Ohio . . .	+39 6 26.5	-11 20.5	...	9.999421	+5 37 59.00	+55.52
55	Cleveland, Ohio . . .	+41 30 14.5 ^c	-11 30.2	215 ^c	9.999375	+5 26 25.86 ^c	+53.62
56	Clinton, N. Y.	+43 3 17.0	-11 33.9	276	9.999340	+5 1 37.45	+49.55
57	Coimbra, Portugal . . .	+40 12 24.5	-11 25.6	99	9.999400	+0 33 43.1	+ 5.54
58	Columbia, Mo.	+38 56 51.7 ^d	-11 19.7	225 ^e	9.999440	+6 9 18.33 ^d	+60.67
59	Columbus, Ohio . . .	+39 59 50.4 ^d	-11 24.7	233 ^d	9.999414	+5 32 2.60 ^d	+54.55
60	Copenhagen, Denmark . .	+55 41 12.6	-10 48.6	14	9.999005	-0 50 18.69 ^f	- 8.26
61	Cordova, Arg. Rep. . . .	-31 25 15.5 ^g	+10 18.0	434 ^g	9.999634	+4 16 48.22 ^g	+42.19
62	Cracow, Austria . . .	+50 3 52.0 ^a	-11 25.2	221 ^a	9.999157	-1 19 50.27 ^a	-13.12
63	Danzig, Prussia . . .	+54 21 18.0	-10 59.6	3	9.999036	-1 14 39.6	-12.26
64	Dehra Dun, India . . .	+30 18 51.8 ^h	-10 5.3	681 ^h	9.999676	-5 12 11.76 ^h	-51.29
65	Denver, Colo.	+39 40 36.4 ^a	-11 23.3	1644 ⁱ	9.999518	+6 59 47.72 ^a	+68.96
66	Des Moines, Iowa . . .	+41 36 0	-11 30.5	296	9.999378	+6 14 30.56	+61.52
67	Dorpat (Jurjew), Russia .	+58 22 47.2 ^a	-10 22.1	67 ^a	9.998945	-1 46 53.22 ^a	-17.56
68	Dresden, Saxony . . .	+51 2 16.8	-11 20.8	121	9.999126	-0 54 54.74	- 9.02
69	Dublin, Ireland . . .	+53 23 13.1 ^a	-11 6.7	86 ^a	9.999066	+0 25 21.1 ^a	+ 4.16
70	Dun Echt, Scotland . . .	+57 9 36	-10 34.8	141	9.998979	+0 9 40.0	+ 1.59
71	Durham, England . . .	+54 46 6.2 ^j	-10 56.4	107 ^k	9.999033	+0 6 19.75 ^j	+ 1.04
72	Düsseldorf, Prussia . . .	+51 12 25.0 ^l	-11 19.9	46 ^l	9.999117	-0 27 2.69 ^l	- 4.44
73	Edinburgh, Scotland . .	+55 55 30.0 ^a	-10 46.5	134 ^m	9.999007	+0 12 44.22 ^a	+ 2.09
74	Edinburgh, Scotland . .	+55 57 23.2 ⁿ	-10 46.2	106 ^o	9.998995	+0 12 43.05 ⁿ	+ 2.09
75	Elmira, N. Y.	+42 6 25	-11 31.9	...	9.999345	+5 7 13.90	+50.47
76	Evanston, Ill.	+42 3 33.4	-11 31.8	175	9.999358	+5 50 42.3	+57.61
77	Flagstaff, Ariz.	+35 12 30.5	-10 54.7	2210	9.999667	+7 26 44.58	+73.39
78	Gaithersburg, Md. . . .	+39 8 13.2 ^r	-11 20.7	165	9.999431	+5 8 47.73	+50.73
79	Geneva, N. Y.	+42 52 46.2	-11 33.6	152	9.999336	+5 8 1.00	+50.60
80	Geneva, Switzerland . .	+46 11 59.3 ^a	-11 35.2	407 ^a	9.999288	-0 24 36.61 ^a	- 4.04
81	Genoa, Italy	+44 25 9.3 ^a	-11 35.5	105	9.999293	-0 35 41.28 ^a	- 5.86
82	Georgetown, D. C. . . .	+38 54 26.7 ^b	-11 19.5	47	9.999429	+5 8 18.26 ^b	+50.65
83	Glasgow, Mo.	+39 13 45.6	-11 21.1	227	9.999433	+6 11 18.08	+61.00
84	Glasgow, Scotland . . .	+55 52 42.8 ^a	-10 46.9	55 ^p	9.999003	+0 17 10.55 ^a	+ 2.82
85	Gotha, Germany	+50 56 37.9 ^l	-11 21.2	322 ^a	9.999142	-0 42 50.51 ^l	- 7.04
86	Gotha, Germany	+50 56 4.4 ^j	-11 21.2	360 ^j	9.999145	-0 42 55.09 ^j	- 7.06
87	Göttingen, Prussia . . .	+51 31 48.1 ^q	-11 18.2	161 ^q	9.999116	-0 39 46.22 ^q	- 6.53
88	Greencastle, Ind.	+39 38 46.6 ^a	-11 23.1	262 ^a	9.999425	+5 47 24.36 ^a	+57.07
89	Greenwich, England . . .	+51 28 38.2 ^a	-11 18.5	49 ^a	9.999110	0 0 0.00 ^a	0.00
90	Hamburg, Germany . . .	+53 33 6.0	-11 5.6	25	9.999057	-0 39 53.60 ^a	- 6.55
91	Hamburg, Germany . . .	+53 32 51.3 ^d	-11 5.6	30 ^d	9.999058	-0 39 53.46 ^d	- 6.55
92	Hanover, N. H.	+43 42 15.3	-11 34.8	163	9.999317	+4 49 8.02	+47.50
93	Haverford, Pa.	+40 0 40.1 ^r	-11 24.8	...	9.999398	+5 1 12.70 ^r	+49.48
94	Heidelberg, Baden . . .	+49 23 55.2 ^s	-11 27.8	567 ^s	9.999198	-0 34 53.13 ^s	- 5.73
95	Heidelberg, Baden . . .	+49 23 55.7 ^t	-11 27.8	570 ^t	9.999198	-0 34 52.96 ^t	- 5.73
96	Heidelberg, Baden . . .	+49 24 34.3 ^l	-11 27.8	126 ^l	9.999168	-0 34 46.80 ^l	- 5.71
97	Helsingfors, Finland . .	+60 9 42.3 ^a	-10 1.5	33 ^a	9.998903	-1 39 49.10 ^a	-16.40
98	Herény, Hungary	+47 15 47.4	-11 33.7	229	9.999229	-1 6 24.7	-10.91
99	Hong Kong, China . . .	+22 18 13.2 ^j	- 8 7.4	33 ^j	9.999793	-7 36 41.86 ^j	-75.01
100	Iowa City, Iowa	+41 40 0	-11 30.7	183	9.999369	+6 6 6	+60.14

^a Meridian circle.^b Center of dome.^c Zenith telescope pier.^d Transit pier.^e Observatory bench mark.^f Center of observatory.^g Old meridian circle.^h Floor-level of zenith sector pillar.ⁱ Main floor.^j Transit instrument.^k Barometer in transit room.^l Equatorial.^m Standard barometer.ⁿ Point midway between transit instrument and mural circle.^o Floor of main building.^p Floor of meridian circle room.^q Position of meridian circle before 1888.^r Zenith telescope.^s Repsold meridian circle.^t Bruce telescope.

No.	Authority for—		Description.
	Latitude.	Longitude.	
51	U. S. Lake Survey, 1864.	Smithsonian Report, 1886.	^a Dearborn Observatory.
52	<i>Astron. Nach.</i> , Nr. 3193, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
53	<i>Publications of the Obs.</i> , 1908.	<i>Astronomical Journal</i> , 1897.	Cincinnati Obs., since 1873.
54	Letter from Director, 1897.	<i>Astronomical Journal</i> , 1854.	Cincinnati Obs. before 1873.
55	Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
56	<i>Astron. Nach.</i> , Nr. 2553, 1883.	<i>Astron. Nach.</i> , Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
57	<i>Eph. Astron. de Coimbra</i> , 1889.	<i>Eph. Astron. de Coimbra</i> , 1889.	University Observatory.
58	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	Laws Obs., Univ. of Mo.
59	Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
60	<i>British Nautical Almanac.</i>	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
61	<i>Resultados del Obs.</i> , 1887.	<i>Resultados del Obs.</i> , 1887.	National Observatory.
62	Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
63	Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
64	<i>Great Trig. Survey of India</i> , 1908.	Letter from Supt. of Survey, 1913.	Haig Obs., Trig. Survey of India.
65	Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
66	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Drake Univ. Obs.
67	<i>Publikationen der Sternw.</i> , 1911.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
68	<i>Berliner Jahrbuch.</i>	<i>Berliner Jahrbuch.</i>	^b Baron Engelhardt's Obs.
69	<i>Trans. Royal Dublin Soc.</i> , 1889.	<i>Trans. Royal Irish Acad.</i> , 1838.	Dunstink Obs., Trinity College.
70	Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	^c Lord Crawford's Obs.
71	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
72	<i>Astron. Nach.</i> , Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
73	<i>Monthly Notices, R. A. S.</i> , 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
74	<i>Monthly Notices, R. A. S.</i> , 1886.	<i>Edinburgh Observations</i> , 1858.	^d Royal Obs. before 1895; Calton Hill.
75	Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
76	Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
77	<i>British Nautical Almanac.</i>	<i>British Nautical Almanac.</i>	Lowell Observatory.
78	See footnote (^j).	See footnote (^k).	International Lat. Obs.
79	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Smith Observatory.
80	<i>Memoire par J. Pidoux</i> , 1900.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Municipal Observatory.
81	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Hydrographic Institute.
82	See footnote (^e).	See footnote (^e).	Georgetown College Obs.
83	<i>Astron. Nach.</i> , Nr. 2625, 1884.	<i>Washington Observations</i> , 1877.	Morrison Observatory.
84	<i>First Glasgow Catalogue</i> , 1870.	<i>Monthly Notices, R. A. S.</i> , 1865.	University Observatory.
85	Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
86	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857.
87	<i>Astron. Nach.</i> , Nr. 4428, 1910.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
88	Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
89	<i>Greenwich Observations</i> , 1910.	<i>Greenwich Observations</i> , 1910.	^f Royal Observatory.
90	Letter, Director new Obs., 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^g Hamburg Observatory before 1909.
91	Letter from Director, 1913.	Letter from Director, 1913.	^h Imperial Marine Obs.
92	Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.
93	<i>Proc. Amer. Ph. Soc.</i> , 1883.	<i>Proc. Amer. Ph. Soc.</i> , 1883.	Haverford College Obs.
94	Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
95	<i>Publik. des Obs., Königstuhl</i> , 1902.	<i>Publik. des Obs., Königstuhl</i> , 1902.	Astrophys. Inst., Königstuhl Obs.
96	<i>Publik. des Obs., Königstuhl</i> , 1902.	<i>Publik. des Obs., Königstuhl</i> , 1902.	ⁱ Dr. Wolf's Obs. before 1898.
97	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
98	<i>Astron. Nach.</i> , Nr. 2633, 1884.	<i>British Nautical Almanac.</i>	Astrophysical Observatory.
99	<i>Hong Kong Observations</i> , 1897.	Letter from Director, 1897.	Colonial Observatory.
100	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Obs., Univ. of Iowa.

^a Transferred to Evanston, Ill., in 1887.^b Instruments transferred to Univ. of Kasan in 1897.^c Instruments transferred to Royal Obs. at Edinburgh in 1896.^d City Obs. since 1896.^e Based upon data from the U. S. C. and G. Survey.^f Point of reference before 1851, 7½ ft. N., 19 ft. W.^g At Bergedorf since 1909.^h Transit instrument before 1908, 0° 5' N., 0° 04' W.ⁱ Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1898.^j *Resultate des Internationalen Breitendienstes*, 1900-1908.^k *Resultate des Internationalen Breitendienstes*, Band I, 1903.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ' "	' "			h m s	s
101	Ithaca, N. Y.	+42 26 47.3 ^a	-11 32.6	256 ^a	9.999354	+5 5 55.99 ^a	+50.26
102	Ithaca, N. Y.	+42 26 51.4	-11 32.6		9.999337	+5 5 56.47	+50.26
103	Jamaica, West Indies . .	+18 24 51 ^b	-6 55.9	540 ^b	9.999892	+5 11 29.48 ^b	+51.17
104	Jena, Saxe-Weimar . . .	+50 55 34.9 ^c	-11 21.3	165 ^c	9.999132	-0 46 20.22 ^c	-7.61
105	Jena, Saxe-Weimar . . .	+50 55 35.8	-11 21.3	155	9.999131	-0 46 20.31	-7.61
106	Jena, Saxe-Weimar . . .	+50 56 11.0	-11 21.3	174	9.999132	-0 46 20.73	-7.61
107	Johannesburg, Transvaal	-26 10 54.6 ^d	+9 9.8	1804 ^d	9.999840	-1 52 18.0 ^d	-18.45
108	Kalocsa, Hungary	+46 31 41.7 ^b	-11 34.8	117 ^e	9.999240	-1 15 54.12 ^b	-12.47
109	Kasan, Russia	+55 50 20.0 ^f	-10 47.3	98 ^f	9.999007	-3 15 15.61 ^f	-32.08
110	Kasan, Russia	+55 47 23.9 ^g	-10 47.7	79 ^g	9.999007	-3 16 29.00 ^g	-32.28
111	Kew, England	+51 28 6	-11 18.5	10	9.999108	+0 1 15.1	+0.21
112	Kief, Russia	+50 27 10.0 ^w	-11 23.5	179 ^f	9.999145	-2 2 0.56 ^f	-20.04
113	Kiel, Prussia	+54 20 27.6 ^f	-10 59.7	52 ^f	9.999040	-0 40 35.45 ^f	-6.67
114	Kis-Kartal, Hungary . . .	+47 41 54.8	-11 32.8		9.999202	-1 18 11.7	-12.85
115	Königsberg, Prussia . . .	+54 42 50.5 ^f	-10 56.8	24 ^f	9.999029	-1 21 58.97 ^f	-13.47
116	Kremsmunster, Austria . .	+48 3 23.1 ^f	-11 32.0	384 ^f	9.999220	-0 56 31.58 ^f	-9.29
117	La Plata, Arg. Rep. . . .	-34 54 31.8 ^h	+10 52.2	18 ^h	9.999525	+3 51 44.8 ^h	+38.07
118	Leiden, Netherlands . . .	+52 9 19.8 ^f	-11 14.6	6 ^f	9.999090	-0 17 56.15 ^f	-2.95
119	Leipzig, Saxony	+51 20 5.9 ⁱ	-11 19.2	119 ⁱ	9.999118	-0 49 33.92 ⁱ	-8.14
120	Leipzig, Saxony	+51 20 20.1	-11 19.2		9.999110	-0 49 29.92	-8.13
121	Liege, Belgium	+50 37 6	-11 22.8	127	9.999137	-0 22 15.44	-3.66
122	Lisbon (Tapada), Portugal	+38 42 30.5 ^f	-11 18.5	95 ^f	9.999437	+0 36 44.68 ^f	+6.04
123	Liverpool, England	+53 24 4.8	-11 6.6	61	9.999064	+0 12 17.33	+2.02
124	Liverpool, England	+53 24 47.8	-11 6.5		9.999059	+0 12 0.11	+1.97
125	Lund, Sweden	+55 41 51.6 ⁱ	-10 48.5	38	9.999006	-0 52 44.97 ⁱ	-8.67
126	Lund, Sweden	+55 52 12.0	-10 47.0		9.999000	-0 52 47.50	-8.67
127	Lussinpiccolo, Austria . .	+44 32 11.0	-11 35.5	42	9.999286	-0 57 52.41	-9.51
128	Lyons, France	+45 41 41.0	-11 35.5	299	9.999274	-0 19 8.52 ^k	-3.14
129	Madison, Wis.	+43 4 36.8 ^f	-11 33.9	292 ^l	9.999340	+5 57 37.90 ^f	+58.75
130	Madras, India	+13 4 8.0 ^f	-5 6.5	7	9.999926	-5 20 59.14	-52.73
131	Madrid, Spain	+40 24 30.0 ^m	-11 26.4	655 ^m	9.999433	+0 14 45.09 ^m	+2.42
132	Manila, P. I.	+14 34 41	-5 38.2	3	9.999908	-8 3 54.2	-79.48
133	Mare Island, Cal.	+38 5 55.8 ⁿ	-11 15.0	18 ⁿ	9.999447	+8 9 5.63 ⁿ	+80.35
134	Markree, Ireland	+54 10 31.8	-11 1.0	45	9.999044	+0 33 48.4	+5.55
135	Marseilles, France	+43 18 19 ^f	-11 34.3	75 ^o	9.999320	-0 21 34.55 ^f	-3.54
136	Marseilles, France	+43 17 52	-11 34.3	27	9.999317	-0 21 28.1	-3.53
137	Mauritius (Port Louis) . .	-20 5 39	+7 27.7	54	9.999832	-3 50 12.6	-37.82
138	Melbourne, Victoria . . .	-37 49 53.2 ^p	+11 13.4	28 ^q	9.999454	-9 39 53.92 ^p	-95.26
139	Meudon, France	+48 48 18	-11 29.8	162	9.999185	-0 8 55.6	-1.47
140	Middletown, Conn.	+41 33 16.0	-11 30.4		9.999359	+4 50 37.18	+47.74
141	Milan, Italy	+45 27 59.3	-11 35.6	120	9.999268	-0 36 45.88 ^q	-6.04
142	Minneapolis, Minn.	+44 58 40.0 ^r	-11 35.7	260 ^r	9.999290	+6 12 56.84 ^r	+61.27
143	Mizusawa, Japan	+39 8 3.6 ^x	-11 20.7	62	9.999424	-9 24 30.75	-92.74
144	Modena, Italy	+44 38 51.4	-11 35.6	64	9.999285	-0 43 43.40	-7.18
145	Montreal, Canada	+45 30 20 ^s	-11 35.6	57 ^s	9.999262	+4 54 18.63 ^s	+48.35
146	Moscow (Presnia), Russia	+55 45 19.5	-10 48.0	150 ^f	9.999012	-2 30 17.03 ^f	-24.69
147	Mount Hamilton, Cal. . . .	+37 20 25.6 ^r	-11 10.4	1284 ^r	9.999552	+8 6 34.89 ^r	+79.93
148	Mount Wilson, Cal.	+34 12 59.5 ^t	-10 46.2	1799 ^t	9.999663	+7 52 14.33 ^t	+77.58
149	Mount Wilson, Cal.	+34 12 55	-10 46.1	1727 ^u	9.999658	+7 52 14.3	+77.58
150	Munich, Bavaria	+48 8 45.5 ^v	-11 31.7	529 ^u	9.999227	-0 46 26.02 ^v	-7.63

^a Top of east pier in transit room.^b Transit instrument pier.^c Bamberg equatorial.^d International latitude hut.^e Seven-inch equatorial.^f Meridian circle.^g Center of great dome.^h Gautier meridian circle.ⁱ Center of observatory.^j Center of dome.^k Pier of small meridian circle.^l Main floor.^m Center of rotunda.ⁿ East transit instrument.^o Barometer.^p Old meridian circle.^q Floor of meridian room.^r Transit instrument.^s East transit pier.^t Snow telescope pier.^u Floor.^v West dome.^w Photographic equatorial, 41 feet south of prime vertical transit.^x Zenith telescope.

No.	Authority for—		Description.
	Latitude.	Longitude.	
101	Letter from the Dean, 1913.	Letter from the Dean, 1913.	^a Fuertes Obs., Cornell Univ.
102	Letter from the Dean, 1913.	Letter from the Dean, 1913.	^b Fuertes Obs., Cornell Univ.
103	<i>Memoirs, R. A. S.</i> , 1879.	See footnote (c).	Mr. Hall's Obs., Montego Bay.
104	Letter from Director, 1913.	Letter from Director, 1913.	Univ. Obs., since 1888.
105	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Univ. Obs., before 1888.
106	<i>V. J. S. Astron. Gesell.</i> , 1910.	<i>V. J. S. Astron. Gesell.</i> , 1910.	The late Dr. Winkler's Obs.
107	Transvaal Obs. <i>Circular</i> , 1910.	Transvaal Obs. <i>Circular</i> , 1910.	Union Obs., formerly Transvaal Obs.
108	Letter from Director, 1913.	Letter from Director, 1913.	Archiepiscopal Haynald Obs.
109	Letter from Director, 1913.	Publications of the Obs., 1911.	Engelhardt Obs., Univ. of Kasan.
110	Publications of the Obs., 1911.	Letter from Director, 1913.	University Observatory.
111	Letter from Director, 1897.	Letter from Director, 1897.	Meteorological Obs., London.
112	<i>Annales de l'Obs.</i> , Vol. IV, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
113	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^d Royal University Obs.
114	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Near Aaszód, Hungary.
115	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
116	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of the Benedictines.
117	Letter from Director, 1913.	Letter from Director, 1913.	National Univ. Obs.
118	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
119	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Obs., since 1861.
120	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1861.
121	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	University Obs., Cointe.
122	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of Lisbon.
123	<i>Monthly Notices, R. A. S.</i> , 1894.	<i>Monthly Notices, R. A. S.</i> , 1894.	Bidston, Birkenhead, since 1867.
124	<i>British Nautical Almanac</i> , 1872.	<i>British Nautical Almanac</i> , 1872.	Liverpool Obs., before 1867.
125	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Univ. Obs., since 1867.
126	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Royal Univ. Obs., before 1867.
127	Letter from Director, 1897.	Letter from Director, 1897.	Manora Observatory.
128	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of the Univ., St. Genis Laval.
129	Publications of the Obs., 1892.	Letter from Director, 1912.	Washburn Obs., Univ. of Wis.
130	<i>Great Trig. Survey of India</i> , 1906.	<i>Great Trig. Survey of India</i> , 1901.	Obs. founded by East India Co.
131	<i>Annuario del Obs.</i> , 1912.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Astron. and Meteorolog. Obs.
132	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Meteorological Observatory.
133	Letter from Director, 1913.	<i>Lick Obs. Bulletin</i> , 1908.	Chronom. and Time Sta., Navy Yd.
134	<i>Astron. Nach.</i> , Nr. 758, 1851.	<i>British Nautical Almanac</i> , 1801.	Col. Cooper's Observatory.
135	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	See footnote (e).
136	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	See footnote (f).
137	<i>Mag. and Meteor. Results</i> , 1908.	<i>Mag. and Meteor. Results</i> , 1908.	Royal Alfred Obs.
138	<i>Astron. Results</i> , 1881-84.	¹ <i>Astron. Results</i> , 1881-84.	^g Government Observatory.
139	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Seine-et-Oise, near Paris.
140	Letter from Director, 1894.	Letter from Director, 1894.	Wesleyan University Obs.
141	<i>Pubbl. del R. Osserv.</i> , 1914.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory, Brera.
142	Letter from Director, 1913.	Letter from Director, 1913.	Obs. Univ. of Minn.
143	See footnote (h).	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	International Lat. Obs.
144	Letter from Director, 1913.	Letter from Director, 1913.	Royal Univ. Geophysical Obs.
145	Letter from Director, 1912.	<i>U. S. C. and G. S. Report</i> , 1897.	McGill University Obs.
146	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of the Imperial Univ.
147	Publications of the Obs., 1900.	<i>U. S. C. and G. S. Report</i> , 1897.	Lick Obs., Univ. of Cal.
148	<i>Astrophysical Journal</i> , 1906.	<i>Astrophysical Journal</i> , 1906.	Solar Obs., Carnegie Inst.
149	Letter from C. G. Abbot, 1912.	Letter from C. G. Abbot, 1912.	Branch of Smithsonian Astrophys. Obs.
150	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.

^a Since 1902.^b Before 1902.^c *British Report on Transit of Venus*, 1882.^d Old position of meridian circle, 0° 5' N., 0° 12' E.^e National Obs., Univ. of Aix-Marseille, since 1864-66.^f National Obs., at Accoules, before 1864-66.^g Transferred from Williamstown in 1861.^h *Resultate des Internationalen Breitendienstes*, 1900-1908.¹ With the new values of the longitudes of Adelaide and Sydney.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		° ' "	' "			h m s	s
151	Naples, Italy	+40 51 46.3	-11 28.1	164	9.999388	-0 57 1.70 α	- 9.37
152	Nashville, Tenn. . . .	+36 8 54.4 b	-11 2.0	172 c	9.999505	+5 47 12.2	+57.04
153	Neuchâtel, Switzerland	+46 59 50.6	-11 34.1	488	9.999254	-0 27 49.90 d	- 4.57
154	New Brunswick, N. J. .	+40 30 1.4 b	-11 26.7	21 b	9.999387	+4 57 47.45 b	+48.92
155	New Haven, Conn. . .	+41 19 22.3	-11 29.6	40	9.999368	+4 51 40.58	+47.92
156	New Haven, Conn. . .	+41 18 36.5	-11 29.6	...	9.999365	+4 51 42.16	+47.92
157	New York, N. Y. . . .	+40 48 34.6	-11 27.9	25	9.999380	+4 55 50	+48.60
158	New York, N. Y. . . .	+40 45 23.1	-11 27.7	...	9.999379	+4 55 53.64	+48.61
159	Nice, France	+43 43 16.9 e	-11 34.9	378	9.999330	-0 29 12.15 e	- 4.80
160	Nikolaieff, Russia . .	+46 58 22.1	-11 34.2	55	9.999225	-2 7 53.78 α	-21.01
161	Northampton, Mass. .	+42 19 1.9 b	-11 32.4	70 b	9.999345	+4 50 33.10 b	+47.73
162	Northfield, Minn. . .	+44 27 41.6 f	-11 35.5	290 f	9.999305	+6 12 35.92 f	+61.21
163	Oakland, Cal.	+37 48 5 d	-11 13.2	11 d	9.999454	+8 9 6.55 d	+80.35
164	Odesa, Russia	+46 28 37.5	-11 34.9	...	9.999234	-2 3 2.18 b	-20.21
165	Odesa, Russia	+46 28 36.7 d	-11 34.9	55 d	9.999237	-2 3 2.04 d	-20.21
166	O-Gyalla, Hungary . .	+47 52 27.3	-11 32.4	113	9.999206	-1 12 45.49	-11.95
167	Omaha, Nebr.	+41 16 5.6 b	-11 29.5	344 b	9.999390	+6 23 46.96 b	+63.05
168	Orono, Me. ^a	+44 54 0	-11 35.6	38	9.999277	+4 34 40.3	+45.12
169	Ottawa, Canada	+45 23 39.1 d	-11 35.6	85 d	9.999267	+5 2 51.98 d	+49.75
170	Oxford, Miss.	+34 22 12.6	-10 47.5	...	9.999536	+5 58 7.18	+58.83
171	Oxford, England	+51 45 35.6 d	-11 16.9	65 b	9.999104	+0 5 2.6	+ 0.83
172	Oxford, England	+51 45 34.2	-11 16.9	64	9.999104	+0 5 0.40	+ 0.82
173	Padua, Italy	+45 24 1.0 f	-11 35.6	31 f	9.999263	-0 47 29.13 f	- 7.80
174	Palermo, Sicily	+38 6 44.0 k	-11 15.1	76 d	9.999451	-0 53 25.87	- 8.78
175	Paris, France	+48 50 11.2 l	-11 29.8	67 m	9.999178	-0 9 20.93 n	- 1.53
176	Perth, West Australia .	-31 57 8.9 d	+10 23.8	60	9.999597	-7 43 21.51 d	-76.12
177	Philadelphia, Pa. . . .	+39 58 2.1 o	-11 24.6	74 o	9.999404	+5 1 6.81 o	+49.46
178	Pola, Austria	+44 51 48.6 d	-11 35.6	32 d	9.999277	-0 55 23.07 d	- 9.10
179	Potsdam, Prussia . . .	+52 22 56.0 p	-11 13.3	97 p	9.999001	-0 52 15.86 p	- 8.59
180	Poughkeepsie, N. Y. .	+41 41 18	-11 30.8	61	9.999360	+4 55 33.6 b	+48.55
181	Prague, Bohemia	+50 5 16.0 o	-11 25.1	197 o	9.999155	-0 57 40.28 o	- 9.47
182	Princeton, N. J.	+40 20 55.8	-11 26.1	75	9.999395	+4 58 39.44	+49.06
183	Princeton, N. J.	+40 20 57.8 d	-11 26.1	65 d	9.999394	+4 58 37.61 d	+49.06
184	Providence, R. I. . . .	+41 50 21	-11 31.2	64	9.999356	+4 45 35.95	+46.92
185	Providence, R. I. . . .	+41 49 46.4	-11 31.2	...	9.999352	+4 45 37.64	+46.92
186	Pulkowa, Russia	+59 46 18.7 q	-10 6.2	75 q	9.998914	-2 1 18.57 q	-19.93
187	Quebec, Canada	+46 47 59.2	-11 34.4	90	9.999231	+4 44 52.71 b	+46.80
188	Quito, Ecuador	- 0 14 0	+ 0 5.6	2908	0.000198	+5 14 6.66	+51.60
189	Riga, Russia	+56 57 9.3	-10 36.9	...	9.998974	-1 36 28.10 r	-15.85
190	Rio de Janeiro, Brazil .	-22 54 23.8 o	+ 8 17.7	62 o	9.999784	+2 52 41.4 o	+28.37
191	Rome, Italy	+41 53 53.6 d	-11 31.3	51 f	9.999354	-0 49 55.12 d	- 8.20
192	Rome, Italy	+41 53 33.6 d	-11 31.3	65 q	9.999355	-0 49 56.34 d	- 8.20
193	Rome, Italy	+41 54 12.4 d	-11 31.4	100 d	9.999357	-0 49 48.02 d	- 8.18
194	Rome, Italy	+41 54 16.7	-11 31.4	75 f	9.999355	-0 49 49.28 d	- 8.18
195	San Fernando, Spain . .	+36 27 42.0 s	-11 4.3	30 s	9.999488	+0 24 49.32 s	+ 4.08
196	San Fernando, Spain . .	+36 31 7	-11 4.7	...	9.999485	+0 25 10.82	+ 4.14
197	San Francisco, Cal. . .	+37 47 27.9	-11 13.2	...	9.999454	+8 9 42.86 t	+80.45
198	San Luis, Arg. Rep. . .	-33 17 45.7	+10 37.6	800	9.999616	+4 25 22	+43.60
199	Santiago, Chile	-33 26 42 d	+10 39.0	520 d	9.999594	+4 42 46.0 d	+46.45
200	Santiago, Chile	-33 26 25	+10 38.9	619	9.999600	+4 42 36.5	+46.42
201	Santiago, Chile	-33 33 46 b	+10 40.1	580 b	9.999595	+4 42 46 b	+46.45

α Center of observatory.
 β Transit instrument.
 γ Bench mark on obs. steps.
 δ Meridian circle.
 ϵ Small meridian circle.
 ζ Meridian circle pier.
 η Bench mark in east wall.

θ Barometer basin.
 ι Axis of tower.
 κ Barometer.
 λ Center of south dome.
 μ South facade of observatory.
 ν Level of obs. terrace.
 ξ Cassini's Meridian.

\omicron Center of dome.
 π Center of middle dome.
 ρ Main floor.
 σ Tower of school.
 τ Center of building, ground floor.
 υ West transit pier.

No.	Authority for—		Description.
	Latitude.	Longitude.	
151	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Obs., Capo di Monte.
152	Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
153	Swiss Triangulation, 1890.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Cantonal Observatory.
154	Letter from Director, 1913.	Letter from Director, 1913.	Schanck Obs., Rutgers College.
155	Letter from Director, 1893.	See footnote (a).	Yale Univ. Obs., since 1882.
156	Letter, Director new Obs., 1883.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
157	<i>Contributions from the Obs.</i> , 1906.	<i>Contributions from the Obs.</i> , 1906.	Columbia Univ. Obs., since 1897.
158	Letter from Director, 1879.	<i>British Nautical Almanac.</i>	Columbia Univ. Obs., before 1897.
159	<i>Annales de l'Obs.</i> , Tome II, 1887.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Mt. Gros, near Nice.
160	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Naval Observatory.
161	Letter from Director, 1913.	<i>Harvard Annals</i> , 1893.	Smith College Obs.
162	Letter from Director, 1912.	<i>Publications of Obs.</i> , 1901.	Goodsell Obs., Carleton College.
163	Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
164	Pulkowa <i>Mitteilungen</i> , No. 56, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Branch of Pulkowa Obs.
165	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
166	Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
167	Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
168	Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
169	Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Astronomical Obs.
170	Smithsonian Report, 1880.	Smithsonian Report, 1880.	Obs. Univ. of Mississippi.
171	<i>Radcliffe Catalogue of Stars</i> , 1900.	<i>Radcliffe Observations</i> , 1842.	Radcliffe Observatory.
172	<i>Oxford Astron. Observations</i> , 1878.	<i>Oxford Astron. Observations</i> , 1878.	University Observatory.
173	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
174	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Observatory.
175	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Observatory of Paris.
176	<i>Meridian Observations</i> , Vol. 2, 1906.	<i>Meridian Observations</i> , Vol. 2, 1906.	Government Observatory.
177	Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
178	Letter from Director, 1913.	Letter from Director, 1913.	See footnote (b).
179	<i>Veröff. K. Preuss. Geod. Inst.</i> , 1905.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Astrophysical Obs.
180	Smithsonian Report, 1880.	Smithsonian Report, 1880.	Vassar College Obs.
181	<i>Prague Observations</i> , 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial and Royal Obs.
182	Letter from Director, 1913.	Letter from Director, 1913.	Halsted Obs., Princeton Univ.
183	Letter from Director, 1913.	<i>Washington Observations</i> , 1878.	Obs. of Instruction, Princeton Univ.
184	Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
185	<i>Astron. Nach.</i> , Nr. 2254, 1879.	<i>Astron. Nach.</i> , Nr. 2254, 1879.	Mr. Seagrave's Observatory.
186	<i>Description de l'Obs.</i> , 1845.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. Central Nicolas.
187	Letter from Director, 1912.	Letter from Director, 1912.	Quebec Obs., Plains of Abraham.
188	Letter from Director, 1897.	Letter from Director, 1897.	National Observatory.
189	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Polytechnic School Obs.
190	See footnote (c).	See footnote (c).	National Observatory.
191	<i>Memorie del R. Osserv.</i> , 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
192	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
193	Letter from Director, 1913.	Letter from Director, 1913.	Vatican Obs., since 1906-7.
194	<i>Pubbl. della Specola Vaticana</i> , 1905.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Vatican Obs., before 1906-7.
195	<i>Annales del Obs.</i> , 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
196	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Naval Obs., before 1797.
197	Letter from Director, 1897.	<i>U. S. C. and G. S. Report</i> , 1897.	Davidson Observatory.
198	Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
199	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., since 1862.
200	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	National Obs., before 1862.
201	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., Espejo.

^a Old observatory, 1877-1886, 415 feet W.

^b Observatory of Imperial and Royal Hydrographic Office.

^c Green and Davis, *Telegraphic Determinations of Longitudes on the East Coast of South America*, 1880.

^d In the Gregorian tower.

^e In Cadiz.

^f In Quinta Normal.

^g On the hill Santa Lucia, in Santiago.

^h Based upon data from the U. S. C. and G. Survey.

ⁱ With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ' "	° ' "			h m s	s
202	South Bethlehem, Pa. . .	+40 36 23.2 ^a	-11 27.2	110	9.999391	+ 5 1 31.96 ^a	+ 49.53
203	South Hadley, Mass. . .	+42 15 18.2 ^b	-11 32.2	76 ^b	9.999346	+ 4 50 20.40 ^b	+ 47.70
204	St. Louis, Mo. . .	+38 38 3.0	-11 18.1	. . .	9.999432	+ 6 0 49.26	+ 59.27
205	St. Petersburg, Russia . .	+59 56 32.0	-10 4.2	4	9.998906	- 2 1 11.4	- 19.91
206	Stockholm, Sweden . .	+59 20 32.7 ^c	-10 11.3	44 ^c	9.998922	- 1 12 13.97 ^c	- 11.87
207	Stonyhurst, England . .	+53 50 40	-11 3.4	117 ^c	9.999056	+ 0 9 52.68	+ 1.62
208	Strassburg, Alsace . .	+48 35 0.3 ^c	-11 30.5	144 ^c	9.999190	- 0 31 4.52 ^c	- 5.11
209	Swarthmore, Pa. . .	+39 54 23.3	-11 24.3	. . .	9.999401	+ 5 1 24.89	+ 49.52
210	Sydney, N. S. W. . .	-33 51 41.1	+10 42.9	44	9.999552	-10 4 49.31	- 99.36
211	Syracuse, N. Y. . .	+43 2 13.1	-11 33.9	160	9.999332	+ 5 4 33.36	+ 50.03
212	Syracuse, N. Y. . .	+43 0 48.8 ^h	-11 33.8	137 ^h	9.999332	+ 5 4 34.31 ^h	+ 50.03
213	Tacubaya, Mexico . .	+19 24 17.9 ^c	- 7 14.8	2285 ^c	9.999995	+ 6 36 46.67 ^c	+ 65.18
214	Tashkent, Turkestan . .	+41 19 31.3	-11 29.6	457	9.999396	+ 4 37 10.80	- 45.53
215	Taunton, Mass. . .	+41 54 0	-11 31.3	8	9.999351	+ 4 44 20	+ 46.71
216	Teramo, Italy . . .	+42 39 27 ^d	-11 33.1	398	9.999358	- 0 54 56	- 9.02
217	Tokyo, Japan . . .	+35 39 17.0 ^c	-10 58.3	25	9.999507	- 9 18 58.22 ^e	- 91.82
218	Toronto, Canada . .	+43 39 46.0 ^f	-11 34.8	110 ^g	9.999313	+ 5 17 34.70 ^g	+ 52.17
219	Toronto, Canada . .	+43 40 0.8 ^g	-11 34.8	116 ^g	9.999313	+ 5 17 35.60 ^g	+ 52.17
220	Toulouse, France . .	+43 36 44.0	-11 34.7	194	9.999320	- 0 5 51.23	- 0.96
221	Triest, Austria . . .	+45 38 35.5 ^h	-11 35.5	68 ⁱ	9.999260	- 0 55 5.23 ^h	- 9.05
222	Triest, Austria . . .	+45 38 45.4 ^j	-11 35.5	26 ⁱ	9.999257	- 0 55 3.0	- 9.04
223	Tschardjui, Turkestan . .	+39 8 11.0 ^d	-11 20.7	188 ^d	9.999433	- 4 14 17.2 ^d	- 41.77
224	Tschardjui, Turkestan . .	+39 8 10.7 ^d	-11 20.7	167	9.999431	- 4 13 57.3	- 41.72
225	Tulse Hill, England . .	+51 26 47	-11 18.6	48	9.999111	+ 0 0 27.7	+ 0.08
226	Turin, Italy . . .	+45 2 16.2 ^k	-11 35.7	618 ^k	9.999313	- 0 31 3 ^k	- 5.10
227	Turin, Italy . . .	+45 4 8.3 ^c	-11 35.7	276 ⁱ	9.999288	- 0 30 47.15 ^c	- 5.06
228	Tuscaloosa, Ala. . .	+33 12 36.8 ^c	-10 36.7	69	9.999568	+ 5 50 11.74 ^c	+ 57.53
229	Ukiah, Cal. . .	+39 8 12.1 ^d	-11 20.7	220 ^d	9.999435	+ 8 12 50.3 ^d	+ 80.96
230	Upsala, Sweden . .	+59 51 29.4 ^b	-10 5.2	21 ^b	9.998909	- 1 10 30.12 ^b	- 11.58
231	Urbana, Ill. . . .	+40 6 20.2 ^l	-11 25.2	236 ^l	9.999412	+ 5 52 53.90 ^l	+ 57.97
232	Utrecht, Netherlands . .	+52 5 9.7 ^m	-11 15.0	12 ^m	9.999093	- 0 20 31.0 ^m	- 3.37
233	Utrecht, Netherlands . .	+52 5 13	-11 15.0	23	9.999093	- 0 20 28.9	- 3.36
234	Venice, Italy . . .	+45 26 10.5 ^c	-11 35.6	15 ^c	9.999261	- 0 49 22.12 ^c	- 8.11
235	Vienna, Austria . . .	+48 13 55.1 ⁿ	-11 31.5	240 ⁱ	9.999205	- 1 5 21.35 ⁿ	- 10.74
236	Vienna, Austria . . .	+48 12 35.5	-11 31.6	186 ⁱ	9.999202	- 1 5 31.61	- 10.76
237	Vienna, Austria . . .	+48 12 53.8	-11 31.6	214	9.999204	- 1 5 25.17	- 10.75
238	Vienna, Austria . . .	+48 12 46.7 ^c	-11 31.6	285	9.999209	- 1 5 10.96	- 10.71
239	Warsaw, Russia . . .	+52 13 4.6 ^c	-11 14.3	121 ^c	9.999097	- 1 24 7.25 ^c	- 13.82
240	Washington, D. C. . .	+38 55 14.0 ^o	-11 19.6	82 ^p	9.999431	+ 5 8 15.78 ^o	+ 50.64
241	Washington, D. C. . .	+38 53 38.7 ^q	-11 19.4	31 ^r	9.999428	+ 5 8 12.15 ^q	+ 50.63
242	Washington, D. C. . .	+38 53 17.3 ^s	-11 19.4	10 ^s	9.999427	+ 5 8 6.24 ^s	+ 50.61
243	Washington, D. C. . .	+38 56 14.8 ^a	-11 19.7	. . .	9.999425	+ 5 8 0.0 ^a	+ 50.60
244	Wellesley, Mass. . .	+42 17 34.8	-11 32.3	61	9.999344	+ 4 45 12.7	+ 46.85
245	Wellington, N. Z. . .	-41 17 3.8 ^b	+11 29.5	127 ^b	9.999375	-11 39 4.27 ^b	-114.84
246	West Point, N. Y. . .	+41 23 22.1	-11 29.9	170	9.999375	+ 4 55 50.55	+ 48.60
247	Wilhelmshaven, Germany	+53 31 52.1 ^c	-11 5.7	9 ^c	9.999057	- 0 32 35.06 ^c	- 5.35
248	Williams Bay, Wis. . .	+42 34 12.6 ^t	-11 33.0	320 ^t	9.999355	+ 5 54 13.24 ^t	+ 58.19
249	Williamstown, Mass. . .	+42 42 30	-11 33.2	213	9.999344	+ 4 52 50	+ 48.10
250	Winchester, Mass. . .	+42 27 11	-11 32.7	30	9.999338	+ 4 44 32.4	+ 46.74
251	Windsor, N. S. W. . .	-33 36 30.8 ^b	+10 40.6	16 ^r	9.999556	-10 3 19.9	- 99.11
252	Zô-Sê, China . . .	+31 5 48.0 ^c	-10 14.4	100 ^c	9.999619	- 8 4 44.82 ^c	- 79.63
253	Zurich, Switzerland . .	+47 22 38.3 ^c	-11 33.5	469 ^c	9.999243	- 0 34 12.26 ^c	- 5.62

^a Center of dome.^b Transit instrument.^c Meridian circle.^d Zenith telescope.^e Great transit instrument.^f Main dome.^g Transit pier.^h Equatorial pier.ⁱ Barometer cistern.^j Stone pier in terrace wall.^k Prime vertical instrument.^l 12-inch equatorial.^m Altazimuth pier.ⁿ Central dome.^o Center of the clock room.^p Ground floor of main building.^q Small dome.^r Barometer.^s Riderostat pier.^t 40-inch equatorial.^u Intersection of equatorial axes.

No.	Authority for—		Description.
	Latitude.	Longitude.	
202	Letter from Director, 1913.	<i>Washington Observations</i> , 1876.	Sayre Obs., Lehigh Univ.
203	<i>Amer. Jour. of Sci.</i> , 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
204	Letter from Director, 1897.	<i>U. S. C. and G. S. Report</i> , 1897.	^a Washington University Obs.
205	<i>Astron. Nach.</i> , Nr. 2582, 1884.	<i>Astron. Nach.</i> , Nr. 2582, 1884.	Imperial University Obs.
206	Letter from Director, 1914.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of Acad. of Sci.
207	Letter from Director, 1913.	<i>Monthly Notices, R. A. S.</i> , 1851.	Stonyhurst College Obs.
208	<i>Annalen der Sternw.</i> , 1896.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
209	Letter from Director, 1912.	Letter from Director, 1912.	Sproul Obs., Swarthmore College.
210	<i>Astron. Results</i> , 1879–81.	See footnote (b).	Government Observatory.
211	Letter from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
212	Letter from Director, 1914.	Letter from Director, 1914.	Roe Observatory.
213	<i>Boletín del Obs.</i> , 1914.	<i>Anuario del Obs.</i> , 1902.	National Observatory.
214	Letter from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
215	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
216	<i>Pubbl. dell'Osserv.</i> , 1900.	Letter from Director, 1913.	Collurania Observatory.
217	<i>Annales de l'Obs.</i> , 1894.	<i>Annales de l'Obs.</i> , 1894.	University Observatory.
218	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
219	Letter from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
220	<i>Annales de l'Obs.</i> , 1912.	<i>British Nautical Almanac.</i>	University Observatory.
221	Letter from Director, 1913.	Letter from Director, 1913.	^c Imperial and Royal Maritime Obs.
222	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^d Imperial and Royal Maritime Obs.
223	<i>Astron. Nach.</i> , Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
224	See footnote (c).	See footnote (1).	International Lat. Obs., before 1909.
225	<i>British Nautical Almanac.</i>	<i>British Nautical Almanac.</i>	Obs. of Sir W. Huggins, London.
226	Letter from Director, 1913.	Letter from Director, 1913.	^f Royal Obs. of the Univ., since 1913.
227	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^g Royal Obs. of the Univ., before 1913.
228	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.
229	See footnote (c).	Letter from Director, 1912.	International Lat. Obs.
230	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
231	Letter from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
232	Letter from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
233	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
234	Letter from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
235	See footnote (b).	<i>Astron. Nach.</i> , Nr. 3993, 1905.	ⁱ Imperial and Royal Univ. Obs.
236	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^j Imperial and Royal Univ. Obs.
237	<i>Berliner Jahrbuch.</i>	<i>Berliner Jahrbuch.</i>	Oppolzer Obs., Josephstadt.
238	<i>Publik. der Sternw.</i> , 1892.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Kuffner Obs., Ottakring.
239	<i>Astron. Nach.</i> , Nr. 4666, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
240	<i>U. S. Naval Obs. Publications</i> , 1900.	<i>U. S. C. and G. S. Report</i> , 1897.	U. S. N. Obs., Georgetown Heights.
241	See footnote (m).	<i>U. S. C. and G. S. Report</i> , 1897.	U. S. Naval Obs., 1842–1893.
242	Letter from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
243	<i>Astronomical Journal</i> , 1897.	<i>Astronomical Journal</i> , 1897.	Catholic Univ. Obs., Brookland.
244	Letter from Director, 1912.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Whitin Obs., Wellesley College.
245	<i>New Zealand Gazette</i> , May 7, 1914.	<i>New Zealand Gazette</i> , May 7, 1914.	Hector Observatory.
246	Letter from Director, 1891.	Letter from Director, 1891.	^k U. S. Military Academy.
247	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Naval Obs.
248	<i>Astrophysical Journal</i> , 1901.	<i>Astrophysical Journal</i> , 1901.	Yerkes Obs., Univ. of Chicago.
249	Letter from Director, 1893.	Letter from Director, 1893.	Field Memorial Obs., Williams Coll.
250	Letter from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
251	<i>Monthly Notices, R. A. S.</i> , 1884.	ⁿ <i>Monthly Notices, R. A. S.</i> , 1888.	Mr. John Tebbutt's Obs.
252	<i>Annales de l'Obs.</i> , 1907.	<i>Annales de l'Obs.</i> , 1907.	Obs. of the Jesuits near Shanghai.
253	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

^a Old observatory 0° 125 E.^b Letter from Government Astronomer at Adelaide, 1913.^c Since 1898.^d Before 1898.^e *Resultate des Internationalen Breitenmessens*, 1900–1908.^f At Pino Torinese.^g At Palazzo Madama.^h *Astron. Arbeiten des K. K. Gradmessungs-Bureau*, 1906.ⁱ Since 1879.^j Before 1879.^k Old observatory 9° N., 1° 2 E.^l *Resultate des Internationalen Breitenmessens*, Band I, 1903.^m *Washington Observations* for 1892, Appendix I, pp. XXI and XXXII.ⁿ And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

Tables of lunar distances are no longer given in the Ephemeris, in accordance with the decision of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, March 5, 1917, at 10 P. M., Greenwich Mean Time.

Let α and δ - Right Ascension and Declination of the star
 " α' and δ' - " " " " " " Moon
 " D - Lunar Distance
 Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$
 Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

$\alpha = 4^h 31^m 11^s.0$	$M = 33^\circ 53' 48''$
$\alpha' = 8^h 55^m 24^s.6$	$\delta = +16^\circ 20' 41''$
$\alpha - \alpha' = 19^h 35^m 46^s.4$	$M - \delta = 17^\circ 33' 7''$
$\alpha - \alpha' = 293^\circ 56' 36''$	$\sin \delta' = 9.420069$
$\delta' = + 15^\circ 15' 8''$	$\cos (M - \delta) = 9.979295$
$\tan \delta' = 9.435642$	$\operatorname{cosec} M = 0.253602$
$\sec (\alpha - \alpha') = 0.391653$	$\cos D = 9.652966$
$\tan M = 9.827295$	$D = 63^\circ 16' 22''$

EXAMPLE 2.

Find the lunar distance of Jupiter March 26, 1917, at noon, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate.

Let α and δ - Right Ascension and Declination of the planet
 " α' and δ' - " " " " " " Moon
 " D - Lunar Distance
 Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$
 Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$
 Sin N and $\sin \frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

$\alpha = 2^h 23^m 57^s.5$	$\tan \frac{1}{2} (\alpha - \alpha') = 8.920918 n$
$\alpha' = 3^h 2^m 4^s.6$	$\cos \frac{1}{2} (\delta + \delta') = 9.979520$
$\alpha - \alpha' = 23^h 21^m 52^s.9$	$\operatorname{cosec} \frac{1}{2} (\delta - \delta') = 1.142053 n$
$\alpha - \alpha' = 350^\circ 28' 14''$	$\tan N = 0.042491$
$\delta = + 13^\circ 19' 23''$	$N = 47^\circ 47' 54''$
$\delta' = + 21^\circ 35' 33''$	
$\delta + \delta' = + 34^\circ 54' 56''$	$\sin \frac{1}{2} (\alpha - \alpha') = 8.919414$
$\delta - \delta' = - 8^\circ 16' 10''$	$\cos \frac{1}{2} (\delta + \delta') = 9.979520$
	$\operatorname{cosec} N = 0.130308$
$\frac{1}{2} (\alpha - \alpha') = 175^\circ 14' 7''$	$\sin \frac{1}{2} D = 9.029242$
$\frac{1}{2} (\delta + \delta') = + 17^\circ 27' 28''$	$\frac{1}{2} D = 6^\circ 8' 25''$
$\frac{1}{2} (\delta - \delta') = - 4^\circ 8' 5''$	$D = 12^\circ 16' 50''$

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the apparent right ascension and declination of Polaris for the time of observation.

Subtract the apparent right ascension from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the apparent declination of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For other altitudes than 45° , corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—1917, August 5, at $10^h 40^m 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be $33^\circ 20' 0''$, required the latitude of the place.

Local astronomical mean time	h	m	s
	10	40	30
Reduction from Table III for $10^h 40^m 30^s$		+ 1	45
Greenwich sidereal time of mean noon, August 5, page 10	8	53	52
Reduction from Table III, for longitude ($-3^h 56^m$ west, or plus)		+ 0	39
Sum (having regard to signs) is equal to local sidereal time	19	36	46
R. A. of Polaris (page 281) for time of observation	1	30	56
Remainder is equal to hour-angle of Polaris	18	5	50
Decl. of Polaris (page 281) for time of observation, $88^\circ 51' 43''$			
True altitude	+33	20	0
Correction from Table I		-1	4
Correction from Table Ia			-14
Latitude of the place	+33	18	42

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

Decl.	88° 51' 40''	88° 51' 50''	88° 52' 0''	88° 52' 10''	88° 52' 20''	88° 52' 30''	Decl.
H. A.							H. A.
h m	' "	' "	' "	' "	' "	' "	h m
0 0	-68 20 0	-68 10 0	-68 0 0	-67 50 0	-67 40 0	-67 30 0	24 0
3	68 20 1	68 10 1	68 0 1	67 50 1	67 40 1	67 30 1	23 57
6	68 19 2	68 9 2	67 59 2	67 49 2	67 39 2	67 29 2	54
9	68 17 3	68 7 3	67 57 3	67 47 3	67 37 3	67 27 3	51
12	68 14 3	68 4 3	67 54 3	67 44 3	67 34 3	67 24 3	48
0 15	-68 11 4	-68 1 4	-67 51 4	-67 41 4	-67 31 4	-67 21 4	23 45
18	68 7 5	67 57 5	67 47 5	67 37 5	67 27 5	67 17 5	42
21	68 2 5	67 52 5	67 43 5	67 33 5	67 23 5	67 13 5	39
24	67 57 6	67 47 6	67 37 6	67 27 6	67 17 6	67 7 6	36
27	67 51 7	67 41 7	67 31 7	67 21 7	67 11 7	67 1 7	33
0 30	-67 44 7	-67 34 7	-67 24 7	-67 14 7	-67 4 7	-66 55 8	23 30
33	67 37 8	67 27 8	67 17 8	67 7 8	66 57 8	66 47 8	27
36	67 29 9	67 19 9	67 9 9	66 59 9	66 49 9	66 39 9	24
39	67 20 10	67 10 10	67 0 10	66 50 10	66 40 10	66 30 10	21
42	67 10 10	67 0 10	66 50 10	66 41 11	66 31 11	66 21 11	18
0 45	-67 0 11	-66 50 11	-66 40 11	-66 30 11	-66 20 11	-66 11 11	23 15
48	66 49 12	66 39 12	66 29 12	66 19 12	66 9 12	66 0 12	12
51	66 37 13	66 27 13	66 17 13	66 8 13	65 58 13	65 48 13	9
54	66 24 13	66 15 13	66 5 13	65 55 13	65 46 13	65 36 13	6
0 57	66 11 13	66 2 14	65 52 14	65 42 14	65 33 14	65 23 14	3
1 0	-65 58 13	-65 48 14	-65 38 14	-65 29 15	-65 19 15	-65 9 15	23 0
3	65 43 15	65 34 15	65 24 15	65 14 15	65 5 15	64 55 15	22 57
6	65 28 16	65 18 16	65 9 16	64 59 16	64 50 16	64 40 16	54
9	65 12 16	65 2 16	64 53 16	64 43 16	64 34 16	64 24 16	51
1 12	-64 56 16	-64 46 16	-64 36 17	-64 27 16	-64 18 16	-64 8 16	22 48

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

Decl. H. A.	88° 51' 40''	88° 51' 50''	88° 52' 0''	88° 52' 10''	88° 52' 20''	88° 52' 30''	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
1 12	-64 56 18	-64 46 17	-64 36 17	-64 27 17	-64 18 18	-64 8 17	22 48
15	64 38 18	64 29 18	64 19 17	64 10 18	64 0 17	63 51 18	45
18	64 20 18	64 11 19	64 2 19	63 52 18	63 43 19	63 33 18	42
21	64 2 20	63 52 19	63 43 19	63 34 19	63 24 19	63 15 19	39
24	63 42 20	63 33 20	63 24 20	63 15 20	63 5 19	62 56 20	36
1 27	-63 22 20	-63 13 20	-63 4 20	-62 55 21	-62 46 21	-62 36 20	22 33
30	63 2 21	62 53 21	62 44 21	62 34 21	62 25 21	62 16 21	30
33	62 41 22	62 32 22	62 23 22	62 13 21	62 4 22	61 55 22	27
36	62 19 22	62 10 22	62 1 22	61 52 23	61 42 22	61 33 22	24
39	61 56 23	61 47 23	61 38 23	61 29 23	61 20 23	61 11 23	21
1 42	-61 33 24	-61 24 24	-61 15 24	-61 6 24	-60 57 23	-60 48 23	22 18
45	61 9 24	61 0 25	60 51 24	60 42 24	60 34 25	60 25 24	15
48	60 45 25	60 35 25	60 27 25	60 18 25	60 9 25	60 1 25	12
51	60 20 26	60 10 26	60 2 26	59 53 25	59 44 26	59 36 26	9
54	59 54 26	59 45 26	59 37 27	59 28 26	59 19 26	59 10 26	6
1 57	-59 28 27	-59 19 27	-59 10 27	-59 2 27	-58 53 27	-58 44 26	22 3
2 0	59 1 28	58 52 28	58 43 27	58 35 28	58 26 27	58 18 28	22 0
3	58 33 28	58 24 28	58 16 28	58 7 28	57 59 28	57 50 28	21 57
6	58 5 28	57 56 28	57 48 28	57 39 28	57 31 29	57 22 28	54
9	57 36 29	57 28 30	57 19 29	57 11 29	57 2 29	56 54 29	51
2 12	-57 7 30	-56 58 30	-56 50 30	-56 42 30	-56 33 29	-56 25 30	21 48
15	56 37 31	56 28 30	56 20 30	56 12 31	56 4 31	55 55 30	45
18	56 6 31	55 58 30	55 50 30	55 41 31	55 33 31	55 25 31	42
21	55 35 32	55 27 32	55 19 32	55 10 31	55 2 31	54 54 31	39
24	55 3 32	54 55 32	54 47 32	54 39 32	54 31 32	54 23 32	36
2 27	-54 31 33	-54 23 33	-54 15 33	-54 7 33	-53 59 33	-53 51 33	21 33
30	53 58 34	53 50 34	53 42 33	53 34 33	53 26 33	53 18 33	30
33	53 24 34	53 16 34	53 9 34	53 1 34	52 53 34	52 45 33	27
36	52 50 34	52 42 34	52 35 34	52 27 34	52 19 34	52 12 34	24
39	52 16 35	52 8 35	52 1 35	51 53 35	51 45 34	51 38 35	21
2 42	-51 41 36	-51 33 35	-51 26 36	-51 18 35	-51 11 36	-51 3 36	21 18
45	51 5 36	50 58 36	50 50 36	50 43 36	50 35 36	50 28 36	15
48	50 29 37	50 22 37	50 14 36	50 7 37	49 59 36	49 52 36	12
51	49 52 37	49 45 37	49 38 37	49 30 37	49 23 37	49 16 37	9
54	49 15 38	49 8 38	49 1 38	48 53 37	48 46 37	48 39 37	6
2 57	-48 37 38	-48 30 38	-48 23 38	-48 16 38	-48 9 38	-48 2 38	21 3
3 0	47 59 39	47 52 38	47 45 38	47 38 38	47 31 38	47 24 38	21 0
3	47 20 39	47 13 39	47 6 39	47 0 39	46 53 39	46 46 39	20 57
6	46 41 40	46 34 39	46 27 39	46 21 40	46 14 39	46 7 39	54
9	46 1 40	45 55 40	45 48 40	45 41 40	45 35 40	45 28 40	51
3 12	-45 21 41	-45 15 41	-45 8 40	-45 1 40	-44 55 40	-44 48 40	20 48
15	44 40 41	44 34 41	44 28 41	44 21 41	44 15 41	44 8 41	45
18	43 59 41	43 53 41	43 47 42	43 40 41	43 34 41	43 27 41	42
21	43 18 42	43 12 42	43 5 42	42 59 42	42 53 42	42 46 41	39
24	42 36 43	42 30 43	42 23 42	42 17 42	42 11 42	42 5 42	36
3 27	-41 53 43	-41 47 43	-41 41 42	-41 35 42	-41 29 42	-41 23 42	20 33
30	41 10 43	41 4 43	40 59 43	40 53 43	40 47 43	40 41 43	30
33	40 27 43	40 21 43	40 16 44	40 10 44	40 4 43	39 58 43	27
36	39 44 44	39 38 44	39 32 44	39 26 44	39 21 44	39 15 44	24
39	39 00 45	38 54 45	38 48 44	38 42 44	38 37 44	38 31 44	21
3 42	-38 15 45	-38 9 45	-38 4 45	-37 58 44	-37 53 45	-37 47 44	20 18
45	37 30 45	37 24 45	37 19 45	37 14 45	37 8 45	37 3 45	15
48	36 45 46	36 39 46	36 34 46	36 29 46	36 23 46	36 18 46	12
51	35 59 46	35 54 46	35 48 46	35 43 46	35 38 46	35 33 46	9
54	35 13 46	35 8 46	35 3 46	34 58 46	34 53 46	34 47 46	6
3 57	-34 27 47	-34 22 47	-34 17 47	-34 12 47	-34 7 47	-34 2 47	20 3
4 0	33 40 47	33 35 47	33 30 47	33 25 47	33 20 47	33 15 47	20 0
3	32 53 48	32 48 48	32 43 47	32 38 47	32 34 47	32 29 47	19 57
6	32 5 48	32 0 47	31 56 48	31 51 47	31 47 48	31 42 47	54
4 9	-31 17 48	-31 13 47	-31 8 48	-31 4 47	-30 59 48	-30 55 47	19 51

TABLE I.

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FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

Decl. H. A.	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
4 9	-31 17 48	-31 13 48	-31 8 48	-31 4 48	-30 59 47	-30 55 48	19 51
12	30 29 48	30 25 49	30 20 48	30 16 48	30 12 48	30 7 48	48
15	29 41 49	29 36 49	29 32 49	29 28 48	29 24 48	29 19 48	45
18	28 52 49	28 47 48	28 43 48	28 40 48	28 36 49	28 31 48	42
21	28 3 49	27 59 49	27 55 48	27 51 49	27 47 49	27 43 49	39
4 24	-27 14 50	-27 10 50	-27 6 49	-27 2 49	-26 58 49	-26 54 49	19 36
27	26 24 50	26 20 49	26 17 50	26 13 49	26 9 49	26 5 49	33
30	25 34 50	25 31 49	25 27 50	25 24 49	25 20 49	25 16 49	30
33	24 44 50	24 41 50	24 37 50	24 34 50	24 30 50	24 27 50	27
36	23 54 51	23 51 51	23 47 50	23 44 50	23 40 50	23 37 50	24
4 39	-23 3 51	-23 0 51	-22 57 51	-22 54 51	-22 50 50	-22 47 50	19 21
42	22 12 51	22 9 51	22 6 51	22 3 50	22 0 51	21 57 51	18
45	21 21 51	21 18 51	21 15 51	21 13 51	21 9 50	21 6 50	15
48	20 30 51	20 27 51	20 24 51	20 22 51	20 19 51	20 16 51	12
51	19 39 52	19 36 52	19 33 51	19 31 52	19 28 51	19 25 51	9
4 54	-18 47 52	-18 44 51	-18 42 52	-18 39 51	-18 37 52	-18 34 51	19 6
4 57	17 55 52	17 53 52	17 50 52	17 48 52	17 45 51	17 43 52	3
5 0	17 3 52	17 1 52	16 58 51	16 56 52	16 54 53	16 51 51	19 0
3	16 11 52	16 9 52	16 7 52	16 4 52	16 2 52	16 0 52	18 57
6	15 19 52	15 17 53	15 15 53	15 12 52	15 10 52	15 8 52	54
5 9	-14 27 53	-14 24 52	-14 22 52	-14 20 52	-14 18 52	-14 16 52	18 51
12	13 34 53	13 32 53	13 30 53	13 28 52	13 26 52	13 24 52	48
15	12 41 53	12 39 53	12 37 52	12 36 53	12 34 53	12 32 52	45
18	11 48 53	11 46 53	11 45 53	11 43 53	11 41 52	11 40 53	42
21	10 55 53	10 53 53	10 52 53	10 50 52	10 49 53	10 47 52	39
5 24	-10 2 53	-10 0 53	- 9 59 53	- 9 58 53	- 9 56 52	- 9 55 53	18 36
27	9 9 53	9 7 53	9 6 53	9 5 53	9 4 53	9 2 52	33
30	8 16 54	8 14 53	8 13 53	8 12 53	8 11 53	8 10 53	30
33	7 22 54	7 21 53	7 20 53	7 19 53	7 18 53	7 17 53	27
36	6 28 54	6 28 54	6 27 54	6 26 53	6 25 53	6 24 53	24
5 39	-5 35 54	- 5 34 53	- 5 33 53	- 5 33 53	- 5 32 53	- 5 31 53	18 21
42	4 41 54	4 41 53	4 40 53	4 40 54	4 39 53	4 38 53	18
45	3 48 54	3 48 54	3 47 54	3 46 53	3 46 53	3 45 53	15
48	2 54 54	2 54 54	2 53 54	2 53 53	2 53 53	2 52 53	12
51	2 0 53	2 0 54	2 0 54	2 0 54	2 0 54	1 59 53	9
5 54	- 1 7 54	- 1 6 53	- 1 6 53	- 1 6 53	- 1 6 53	- 1 6 53	18 6
5 57	- 0 13 54	- 0 13 54	- 0 13 53	- 0 13 53	- 0 13 53	- 0 13 53	3
6 0	+ 0 41 53	+ 0 41 54	+ 0 40 54	+ 0 40 53	+ 0 40 53	+ 0 40 53	18 0
3	1 34 54	1 34 54	1 34 53	1 33 54	1 33 53	1 33 53	17 57
6	2 28 54	2 28 53	2 27 53	2 27 53	2 26 53	2 26 53	54
6 9	+ 3 22 53	+ 3 21 54	+ 3 20 54	+ 3 20 53	+ 3 19 53	+ 3 19 53	17 51
12	4 15 54	4 15 53	4 14 53	4 13 53	4 12 53	4 12 52	48
15	5 9 53	5 8 53	5 7 53	5 6 53	5 5 53	5 4 53	45
18	6 2 54	6 1 53	6 0 53	5 59 53	5 58 53	5 57 53	42
21	6 56 53	6 54 54	6 53 53	6 52 53	6 51 53	6 50 53	39
6 24	+ 7 49 53	+ 7 48 53	+ 7 46 53	+ 7 45 53	+ 7 44 53	+ 7 43 52	17 36
27	8 42 53	8 41 53	8 39 53	8 38 53	8 37 52	8 35 53	33
30	9 35 53	9 34 53	9 32 53	9 31 52	9 29 53	9 28 53	30
33	10 28 53	10 27 52	10 25 53	10 23 53	10 22 52	10 20 52	27
36	11 21 53	11 19 53	11 18 52	11 16 52	11 14 52	11 12 53	24
6 39	+12 14 53	+12 12 53	+12 10 53	+12 8 53	+12 6 53	+12 5 52	17 21
42	13 7 52	13 5 52	13 3 52	13 1 52	12 59 52	12 57 51	18
45	13 59 53	13 57 52	13 55 52	13 53 52	13 51 51	13 48 52	15
48	14 52 52	14 49 52	14 47 52	14 45 52	14 42 52	14 40 52	12
51	15 44 52	15 41 52	15 39 52	15 37 51	15 34 52	15 32 51	9
6 54	+16 36 52	+16 33 52	+16 31 51	+16 28 52	+16 26 51	+16 23 51	17 6
6 57	17 28 51	17 25 51	17 22 52	17 20 51	17 17 51	17 14 51	3
7 0	18 19 52	18 16 52	18 14 51	18 11 51	18 8 51	18 5 51	17 0
3	19 11 51	19 8 51	19 5 51	19 2 51	18 59 51	18 56 51	16 57
7 6	+20 2	+19 59	+19 56	+19 53	+19 50	+19 47	16 54

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

Decl. H. A.	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
7 6	+20 2 51	+19 59 51	+19 56 51	+19 53 51	+19 50 51	+19 47 50	16 54
9	20 53 51	20 50 51	20 47 50	20 44 50	20 41 50	20 37 51	51
12	21 44 51	21 41 50	21 37 51	21 34 50	21 31 50	21 28 50	48
15	22 35 50	22 31 50	22 28 50	22 24 50	22 21 50	22 18 50	45
18	23 25 50	23 21 50	23 18 50	23 14 50	23 11 50	23 7 50	42
7 21	+24 15 50	+24 11 50	+24 8 49	+24 4 50	+24 1 49	+23 57 49	16 39
24	25 5 50	25 1 50	24 57 50	24 54 49	24 50 49	24 46 49	36
27	25 55 49	25 51 49	25 47 49	25 43 49	25 39 49	25 35 49	33
30	26 44 49	26 40 50	26 36 49	26 32 49	26 28 49	26 24 48	30
33	27 33 49	27 30 48	27 25 48	27 21 48	27 17 48	27 12 48	27
7 36	+28 22 48	+28 18 48	+28 13 49	+28 9 48	+28 5 48	+28 1 48	16 24
39	29 10 48	29 6 48	29 2 48	28 57 48	28 53 48	28 49 47	21
42	29 58 48	29 54 48	29 50 47	29 45 48	29 41 47	29 36 47	18
45	30 46 48	30 42 47	30 37 47	30 33 48	30 28 47	30 23 47	15
48	31 34 47	31 29 47	31 24 47	31 20 47	31 15 47	31 10 47	12
7 51	+32 21 47	+32 16 47	+32 11 47	+32 7 46	+32 2 46	+31 57 46	16 9
54	33 8 47	33 3 47	32 58 46	32 53 46	32 48 46	32 43 46	6
7 57	33 55 46	33 50 46	33 44 46	33 39 46	33 34 46	33 29 46	3
8 0	34 41 46	34 36 45	34 30 46	34 25 46	34 20 46	34 15 45	16 0
3	35 27 45	35 21 45	35 16 45	35 11 45	35 6 45	35 0 45	15 57
8 6	+36 12 45	+36 7 45	+36 1 45	+35 56 45	+35 51 44	+35 45 44	15 54
9	36 57 45	36 52 44	36 46 45	36 41 44	36 35 44	36 30 44	51
12	37 42 44	37 36 44	37 31 44	37 25 44	37 19 44	37 14 44	48
15	38 26 44	38 20 44	38 15 44	38 9 44	38 3 44	37 58 43	45
18	39 10 44	39 4 44	38 58 44	38 53 43	38 47 43	38 41 43	42
8 21	+39 54 43	+39 48 43	+39 42 43	+39 36 43	+39 30 43	+39 24 43	15 39
24	40 37 43	40 31 42	40 25 42	40 19 42	40 13 42	40 7 42	36
27	41 20 42	41 13 42	41 7 42	41 1 42	40 55 42	40 49 42	33
30	42 2 42	41 55 42	41 49 42	41 43 42	41 37 42	41 31 42	30
33	42 44 41	42 37 42	42 31 41	42 25 41	42 18 41	42 12 41	27
8 36	+43 25 41	+43 19 41	+43 12 41	+43 6 41	+42 59 41	+42 53 40	15 24
39	44 6 40	44 0 40	43 53 40	43 47 40	43 40 40	43 33 40	21
42	44 46 40	44 40 40	44 33 40	44 27 40	44 20 40	44 13 40	18
45	45 26 40	45 20 39	45 13 39	45 7 39	45 0 39	44 53 39	15
48	46 6 39	45 59 39	45 52 39	45 46 39	45 39 39	45 32 39	12
8 51	+46 45 39	+46 38 39	+46 31 39	+46 25 38	+46 18 38	+46 11 38	15 9
54	47 24 38	47 17 38	47 10 38	47 3 38	46 56 38	46 49 38	6
8 57	48 2 38	47 55 38	47 48 37	47 41 37	47 34 37	47 27 37	3
9 0	48 40 37	48 33 37	48 25 37	48 18 37	48 11 37	48 4 37	15 0
3	49 17 37	49 10 36	49 2 37	48 55 36	48 48 36	48 41 36	14 57
9 6	+49 54 36	+49 46 36	+49 39 36	+49 31 36	+49 24 36	+49 17 36	14 54
9	50 30 35	50 22 36	50 15 35	50 7 36	50 0 35	49 53 35	51
12	51 5 35	50 58 35	50 50 35	50 43 35	50 35 35	50 28 35	48
15	51 40 35	51 33 34	51 25 35	51 18 34	51 10 34	51 2 35	45
18	52 15 34	52 7 34	52 0 34	51 52 34	51 44 34	51 37 33	42
9 21	+52 49 34	+52 41 34	+52 34 33	+52 26 33	+52 18 33	+52 10 33	14 39
24	53 23 33	53 15 33	53 7 33	52 59 33	52 51 33	52 43 33	36
27	53 56 32	53 48 32	53 40 32	53 32 32	53 24 32	53 16 32	33
30	54 28 32	54 20 32	54 12 32	54 4 32	53 56 32	53 48 32	30
33	55 0 31	54 52 31	54 44 31	54 36 31	54 28 31	54 19 31	27
9 36	+55 31 31	+55 23 31	+55 15 30	+55 7 30	+54 59 30	+54 50 31	14 24
39	56 2 30	55 54 30	55 45 30	55 37 30	55 29 30	55 21 30	21
42	56 32 30	56 24 29	56 15 30	56 7 30	55 59 29	55 51 29	18
45	57 2 29	56 53 29	56 45 29	56 37 29	56 28 29	56 20 29	15
48	57 31 28	57 22 29	57 14 28	57 6 28	56 57 28	56 49 28	12
9 51	+57 59 28	+57 51 28	+57 42 28	+57 34 27	+57 25 28	+57 17 27	14 9
54	58 27 27	58 19 27	58 10 27	58 1 27	57 53 27	57 44 27	6
9 57	58 54 27	58 46 26	58 37 27	58 28 27	58 20 26	58 11 26	3
10 0	59 21 26	59 12 26	59 4 26	58 55 26	58 46 26	58 37 26	14 0
10 3	+59 47 26	+59 38 26	+59 30 26	+59 21 26	+59 12 26	+59 3 26	13 57

TABLE I.

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FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1917.

Decl. H. A.		88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	Decl. H. A.	
h	m	' "	' "	' "	' "	' "	' "	h	m
10	3	+59 47 26	+59 38 26	+59 30 25	+59 21 25	+59 12 25	+59 3 25	13	57
	6	60 13 24	60 4 24	59 55 25	59 46 25	59 37 25	59 28 25		54
	9	60 37 25	60 28 25	60 20 24	60 11 24	60 2 24	59 53 24		51
	12	61 2 25	60 53 25	60 44 24	60 35 24	60 26 24	60 17 24		48
	15	61 25 23	61 16 23	61 7 23	60 58 23	60 49 23	60 40 23		45
10	18	+61 48 23	+61 39 23	+61 30 22	+61 21 22	+61 12 22	+61 3 22	13	42
	21	62 11 21	62 2 21	61 52 22	61 43 22	61 34 22	61 25 21		39
	24	62 32 21	62 23 21	62 14 21	62 5 22	61 56 22	61 46 21		36
	27	62 53 21	62 44 21	62 35 21	62 26 21	62 17 21	62 7 21		33
	30	63 14 20	63 5 19	62 55 20	62 46 20	62 37 20	62 28 19		30
10	33	+63 34 19	+63 24 20	+63 15 19	+63 6 19	+62 57 19	+62 47 19	13	27
	36	63 53 19	63 44 18	63 34 19	63 25 18	63 16 18	63 6 18		24
	39	64 12 19	64 2 18	63 53 19	63 43 18	63 34 18	63 24 18		21
	42	64 29 17	64 20 18	64 11 18	64 1 18	63 52 18	63 42 18		18
	45	64 47 16	64 37 17	64 28 16	64 18 17	64 9 16	63 59 17		15
10	48	+65 3 16	+64 54 16	+64 44 16	+64 35 16	+64 25 16	+64 16 15	13	12
	51	65 19 15	65 10 15	65 0 15	64 51 15	64 41 15	64 31 15		9
	54	65 34 15	65 25 15	65 15 15	65 6 14	64 56 15	64 46 15		6
10	57	65 49 14	65 40 14	65 30 14	65 20 14	65 11 13	65 1 14		3
11	0	66 3 13	65 54 13	65 44 13	65 34 13	65 24 14	65 15 13	13	0
11	3	+66 16 13	+66 7 12	+65 57 12	+65 47 13	+65 38 12	+65 28 12	12	57
	6	66 29 12	66 19 12	66 9 12	66 0 12	65 50 12	65 40 12		54
	9	66 41 11	66 31 11	66 21 12	66 12 11	66 2 11	65 52 11		51
	12	66 52 11	66 42 11	66 33 10	66 23 11	66 13 11	66 3 11		48
	15	67 3 10	66 53 10	66 43 10	66 33 10	66 24 11	66 14 10		45
11	18	+67 13 9	+67 3 9	+66 53 9	+66 43 9	+66 33 9	+66 24 9	12	42
	21	67 22 8	67 12 8	67 2 9	66 52 9	66 42 9	66 33 8		39
	24	67 30 8	67 20 8	67 11 8	67 1 8	66 51 8	66 41 8		36
	27	67 38 8	67 28 8	67 19 8	67 9 7	66 59 7	66 49 7		33
	30	67 46 6	67 36 6	67 26 6	67 16 6	67 6 6	66 56 6		30
11	33	+67 52 6	+67 42 6	+67 32 6	+67 22 6	+67 12 6	+67 2 6	12	27
	36	67 58 5	67 48 5	67 38 5	67 28 5	67 18 5	67 8 5		24
	39	68 3 5	67 53 5	67 43 5	67 33 5	67 23 5	67 13 5		21
	42	68 8 3	67 58 3	67 48 3	67 38 3	67 28 3	67 18 3		18
	45	68 11 3	68 1 3	67 51 3	67 41 3	67 31 3	67 21 3		15
11	48	+68 14 3	+68 4 3	+67 54 3	+67 44 3	+67 34 3	+67 24 3	12	12
	51	68 17 2	68 7 2	67 57 2	67 47 2	67 37 2	67 27 2		9
	54	68 19 1	68 9 1	67 59 1	67 49 1	67 39 1	67 29 1		6
11	57	68 20 0	68 10 0	68 0 0	67 50 0	67 40 0	67 30 0		3
12	0	+68 20 0	+68 10 0	+68 0 0	+67 50 0	+67 40 0	+67 30 0	12	0

TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken from the following table may be applied when the desired degree of accuracy requires it.

Altitude. H. A.		10°	20°	30°	40°	50°	60°	70°	Altitude. H. A.	
h	h	"	"	"	"	"	"	"	h	h
0	12	0	0	0	0	0	0	0	12	24
1	11	-2	-2	-1	0	0	+2	+5	13	23
2	10	8	7	4	-2	+2	8	18	14	22
3	9	17	13	9	3	4	15	36	15	21
4	8	25	20	13	5	6	23	53	16	20
5	7	32	24	16	6	7	28	66	17	19
6	6	-34	-26	-17	-7	+8	+30	+71	18	18

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SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Side- real.	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	0 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	0 1.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0 0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1 0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2 0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3 0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4 0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5 0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6 0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7 0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8 0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9 0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10 0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11 0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12 0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13 0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14 0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15 0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16 0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17 0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18 0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19 0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20 0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21 0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22 0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23 0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24 0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25 0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26 0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27 0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28 0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29 0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30 0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31 0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32 0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33 0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34 0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35 0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36 0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37 0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38 0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39 0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40 0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41 0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42 0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43 0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44 0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45 0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46 0.126
47	1 26.336	1 36.166	1 45.996	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47 0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48 0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49 0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50 0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51 0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52 0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53 0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54 0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55 0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56 0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57 0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58 0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59 0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.006
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.606	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.996	0 0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1 0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2 0.006
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3 0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.798	1 9.652	4 0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5 0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6 0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7 0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8 0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9 0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10 0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11 0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12 0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13 0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14 0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15 0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16 0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17 0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18 0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19 0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20 0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21 0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22 0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23 0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24 0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25 0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26 0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27 0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28 0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29 0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30 0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31 0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32 0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33 0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34 0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35 0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36 0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37 0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38 0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39 0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40 0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41 0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42 0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43 0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44 0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45 0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46 0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47 0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48 0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49 0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50 0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51 0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52 0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53 0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54 0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55 0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56 0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57 0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58 0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59 0.162

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0 0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1 0.008
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2 0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3 0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4 0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5 0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6 0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7 0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8 0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9 0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10 0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11 0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12 0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13 0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14 0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15 0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16 0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17 0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18 0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19 0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20 0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21 0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22 0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23 0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24 0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25 0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26 0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27 0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28 0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29 0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30 0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31 0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32 0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33 0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34 0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35 0.096
36	1 24.766	1 34.622	1 44.478	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36 0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37 0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38 0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39 0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40 0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41 0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42 0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43 0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.363	2 25.219	2 35.075	44 0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45 0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46 0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47 0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48 0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49 0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50 0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51 0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52 0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53 0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54 0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55 0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56 0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57 0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58 0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59 0.162

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.006
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.		10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat.	
H.A.											H.A.	
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	° ' "
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0	0 0.0
10	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.5	0 3.5	0 3.5	23 50	0 3.5
20	0 6.0	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.8	0 6.9	0 7.1	0 7.1	40	0 7.1
0 30	0 9.0	0 9.2	0 9.5	0 9.6	0 9.8	0 10.0	0 10.1	0 10.3	0 10.6	0 10.6	23 30	0 10.6
40	0 12.0	0 12.3	0 12.6	0 12.8	0 13.0	0 13.2	0 13.5	0 13.8	0 14.1	0 14.1	20	0 14.1
50	0 15.0	0 15.3	0 15.7	0 16.0	0 16.2	0 16.5	0 16.8	0 17.2	0 17.5	0 17.5	10	0 17.5
1 0	0 17.9	0 18.3	0 18.8	0 19.1	0 19.4	0 19.7	0 20.1	0 20.5	0 21.0	0 21.0	23 0	0 21.0
10	0 20.8	0 21.3	0 21.9	0 22.2	0 22.5	0 22.9	0 23.4	0 23.8	0 24.4	0 24.4	22 50	0 24.4
20	0 23.7	0 24.2	0 24.9	0 25.2	0 25.6	0 26.1	0 26.6	0 27.1	0 27.7	0 27.7	40	0 27.7
1 30	0 26.5	0 27.0	0 27.8	0 28.2	0 28.7	0 29.2	0 29.7	0 30.3	0 31.0	0 31.0	22 30	0 31.0
40	0 29.2	0 29.9	0 30.7	0 31.2	0 31.7	0 32.2	0 32.8	0 33.5	0 34.2	0 34.2	20	0 34.2
50	0 31.9	0 32.6	0 33.6	0 34.1	0 34.6	0 35.2	0 35.8	0 36.6	0 37.4	0 37.4	10	0 37.4
2 0	0 34.6	0 35.3	0 36.4	0 36.9	0 37.5	0 38.1	0 38.8	0 39.6	0 40.5	0 40.5	22 0	0 40.5
10	0 37.2	0 37.9	0 39.1	0 39.6	0 40.2	0 40.9	0 41.7	0 42.5	0 43.5	0 43.5	21 50	0 43.5
20	0 39.7	0 40.5	0 41.7	0 42.3	0 42.9	0 43.7	0 44.5	0 45.4	0 46.4	0 46.4	40	0 46.4
2 30	0 42.1	0 43.0	0 44.2	0 44.9	0 45.6	0 46.4	0 47.2	0 48.2	0 49.2	0 49.2	21 30	0 49.2
40	0 44.5	0 45.4	0 46.7	0 47.4	0 48.1	0 48.9	0 49.8	0 50.8	0 52.0	0 52.0	20	0 52.0
50	0 46.7	0 47.7	0 49.1	0 49.8	0 50.6	0 51.4	0 52.4	0 53.4	0 54.6	0 54.6	10	0 54.6
3 0	0 48.9	0 49.9	0 51.4	0 52.1	0 52.9	0 53.8	0 54.8	0 55.9	0 57.1	0 57.1	21 0	0 57.1
10	0 51.0	0 52.0	0 53.6	0 54.3	0 55.2	0 56.1	0 57.1	0 58.3	0 59.5	0 59.5	20 50	0 59.5
20	0 52.9	0 54.0	0 55.6	0 56.4	0 57.3	0 58.2	0 59.3	1 0.5	1 1.8	1 1.8	40	1 1.8
3 30	0 54.8	0 56.0	0 57.6	0 58.4	0 59.3	1 0.3	1 1.4	1 2.7	1 4.0	1 4.0	20 30	1 4.0
40	0 56.6	0 57.8	0 59.5	1 0.3	1 1.2	1 2.2	1 3.4	1 4.7	1 6.1	1 6.1	20	1 6.1
50	0 58.3	0 59.5	1 1.2	1 2.1	1 3.0	1 4.1	1 5.2	1 6.6	1 8.0	1 8.0	10	1 8.0
4 0	0 59.8	1 1.1	1 2.8	1 3.7	1 4.7	1 5.8	1 7.0	1 8.3	1 9.8	1 9.8	20 0	1 9.8
10	1 1.3	1 2.5	1 4.3	1 5.2	1 6.2	1 7.3	1 8.6	1 9.9	1 11.4	1 11.4	19 50	1 11.4
20	1 2.6	1 3.9	1 5.7	1 6.6	1 7.6	1 8.8	1 10.0	1 11.4	1 13.0	1 13.0	40	1 13.0
4 30	1 3.8	1 5.1	1 7.0	1 7.9	1 8.9	1 10.1	1 11.4	1 12.8	1 14.3	1 14.3	19 30	1 14.3
40	1 4.9	1 6.2	1 8.1	1 9.0	1 10.1	1 11.2	1 12.5	1 14.0	1 15.6	1 15.6	20	1 15.6
50	1 5.8	1 7.2	1 9.1	1 10.0	1 11.1	1 12.3	1 13.6	1 15.1	1 16.7	1 16.7	10	1 16.7
5 0	1 6.7	1 8.0	1 9.9	1 10.9	1 12.0	1 13.2	1 14.5	1 16.0	1 17.6	1 17.6	19 0	1 17.6
10	1 7.4	1 8.7	1 10.7	1 11.6	1 12.7	1 13.9	1 15.3	1 16.8	1 18.4	1 18.4	18 50	1 18.4
20	1 8.0	1 9.8	1 11.3	1 12.2	1 13.3	1 14.5	1 15.9	1 17.4	1 19.0	1 19.0	40	1 19.0
5 30	1 8.4	1 9.8	1 11.7	1 12.7	1 13.8	1 15.0	1 16.4	1 17.9	1 19.5	1 19.5	18 30	1 19.5
40	1 8.7	1 10.1	1 12.0	1 13.0	1 14.1	1 15.3	1 16.7	1 18.2	1 19.9	1 19.9	20	1 19.9
50	1 8.9	1 10.3	1 12.2	1 13.2	1 14.3	1 15.5	1 16.9	1 18.4	1 20.1	1 20.1	10	1 20.1
6 0	1 9.0	1 10.3	1 12.3	1 13.2	1 14.3	1 15.6	1 16.9	1 18.4	1 20.1	1 20.1	18 0	1 20.1
10	1 8.9	1 10.2	1 12.2	1 13.2	1 14.2	1 15.5	1 16.8	1 18.3	1 20.0	1 20.0	17 50	1 20.0
20	1 8.7	1 10.0	1 12.0	1 12.9	1 14.0	1 15.2	1 16.6	1 18.0	1 19.7	1 19.7	40	1 19.7
6 30	1 8.3	1 9.7	1 11.6	1 12.5	1 13.6	1 14.8	1 16.2	1 17.6	1 19.3	1 19.3	17 30	1 19.3
40	1 7.9	1 9.2	1 11.1	1 12.0	1 13.1	1 14.3	1 15.6	1 17.1	1 18.7	1 18.7	20	1 18.7
50	1 7.3	1 8.6	1 10.5	1 11.4	1 12.4	1 13.6	1 14.9	1 16.4	1 18.0	1 18.0	10	1 18.0
7 0	1 6.6	1 7.8	1 9.7	1 10.6	1 11.6	1 12.8	1 14.1	1 15.5	1 17.1	1 17.1	17 0	1 17.1
10	1 5.7	1 6.9	1 8.8	1 9.7	1 10.7	1 11.9	1 13.1	1 14.5	1 16.1	1 16.1	16 50	1 16.1
20	1 4.7	1 5.9	1 7.8	1 8.6	1 9.6	1 10.8	1 12.0	1 13.4	1 14.9	1 14.9	40	1 14.9
7 30	1 3.6	1 4.8	1 6.6	1 7.5	1 8.4	1 9.6	1 10.8	1 12.1	1 13.6	1 13.6	16 30	1 13.6
40	1 2.4	1 3.6	1 5.3	1 6.2	1 7.1	1 8.2	1 9.4	1 10.7	1 12.2	1 12.2	20	1 12.2
50	1 1.1	1 2.2	1 3.9	1 4.7	1 5.7	1 6.7	1 7.9	1 9.2	1 10.6	1 10.6	10	1 10.6
8 0	0 59.6	1 0.7	1 2.4	1 3.2	1 4.1	1 5.1	1 6.3	1 7.5	1 8.9	1 8.9	16 0	1 8.9
10	0 58.1	0 59.1	1 0.7	1 1.5	1 2.4	1 3.4	1 4.5	1 5.7	1 7.1	1 7.1	15 50	1 7.1
20	0 56.4	0 57.4	0 59.0	0 59.7	1 0.6	1 1.6	1 2.6	1 3.8	1 5.1	1 5.1	40	1 5.1
8 30	0 54.6	0 55.6	0 57.1	0 57.8	0 58.7	0 59.6	1 0.6	1 1.8	1 3.1	1 3.1	15 30	1 3.1
40	0 52.7	0 53.7	0 55.1	0 55.8	0 56.6	0 57.5	0 58.5	0 59.6	1 0.9	1 0.9	20	1 0.9
50	0 50.7	0 51.6	0 53.0	0 53.7	0 54.5	0 55.4	0 56.3	0 57.4	0 58.6	0 58.6	10	0 58.6
9 0	0 48.6	0 49.5	0 50.8	0 51.5	0 52.2	0 53.1	0 54.0	0 55.0	0 56.1	0 56.1	15 0	0 56.1

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H.A.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H.A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
9 0	0 48.6	0 49.5	0 50.8	0 51.5	0 52.2	0 53.1	0 54.0	0 55.0	0 56.1	15 0
10	0 46.5	0 47.3	0 48.6	0 49.2	0 49.9	0 50.7	0 51.6	0 52.5	0 53.6	14 50
20	0 44.2	0 45.0	0 46.2	0 46.8	0 47.5	0 48.2	0 49.0	0 50.0	0 51.0	40
9 30	0 41.9	0 42.6	0 43.7	0 44.3	0 44.9	0 45.6	0 46.4	0 47.3	0 48.3	14 30
40	0 39.5	0 40.2	0 41.2	0 41.7	0 42.3	0 43.0	0 43.7	0 44.6	0 45.5	20
50	0 37.0	0 37.6	0 38.6	0 39.1	0 39.6	0 40.3	0 41.0	0 41.7	0 42.6	10
10 0	0 34.4	0 35.0	0 35.9	0 36.4	0 36.9	0 37.5	0 38.1	0 38.8	0 39.6	14 0
10	0 31.8	0 32.3	0 33.1	0 33.6	0 34.1	0 34.6	0 35.2	0 35.8	0 36.6	13 50
20	0 29.1	0 29.6	0 30.3	0 30.7	0 31.2	0 31.7	0 32.2	0 32.8	0 33.5	40
10 30	0 26.3	0 26.8	0 27.5	0 27.8	0 28.2	0 28.7	0 29.2	0 29.7	0 30.3	13 30
40	0 23.5	0 23.9	0 24.6	0 24.9	0 25.2	0 25.6	0 26.0	0 26.5	0 27.1	20
50	0 20.7	0 21.0	0 21.6	0 21.9	0 22.2	0 22.5	0 22.9	0 23.3	0 23.8	10
11 0	0 17.8	0 18.1	0 18.6	0 18.8	0 19.1	0 19.4	0 19.7	0 20.1	0 20.5	13 0
10	0 14.9	0 15.1	0 15.5	0 15.7	0 16.0	0 16.2	0 16.5	0 16.8	0 17.1	12 50
20	0 11.9	0 12.1	0 12.5	0 12.6	0 12.8	0 13.0	0 13.2	0 13.5	0 13.7	40
11 30	0 9.0	0 9.1	0 9.4	0 9.5	0 9.6	0 9.8	0 9.9	0 10.1	0 10.3	12 30
40	0 6.0	0 6.1	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.8	0 6.9	20
50	0 3.0	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.5	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. H.A.	32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H.A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
10	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.1	0 4.2	0 4.4	0 4.5	23 50
20	0 7.1	0 7.2	0 7.4	0 7.6	0 7.8	0 8.1	0 8.4	0 8.7	0 9.0	40
0 30	0 10.6	0 10.8	0 11.1	0 11.4	0 11.8	0 12.1	0 12.6	0 13.0	0 13.5	23 30
40	0 14.1	0 14.4	0 14.8	0 15.2	0 15.7	0 16.1	0 16.7	0 17.3	0 18.0	20
50	0 17.5	0 18.0	0 18.4	0 18.9	0 19.5	0 20.1	0 20.8	0 21.6	0 22.4	10
1 0	0 21.0	0 21.5	0 22.0	0 22.6	0 23.3	0 24.1	0 24.9	0 25.8	0 26.8	23 0
10	0 24.4	0 24.9	0 25.6	0 26.3	0 27.1	0 28.0	0 28.9	0 30.0	0 31.2	22 50
20	0 27.7	0 28.4	0 29.1	0 29.9	0 30.8	0 31.8	0 32.9	0 34.1	0 35.4	40
1 30	0 31.0	0 31.7	0 32.5	0 33.4	0 34.4	0 35.6	0 36.8	0 38.1	0 39.6	22 30
40	0 34.2	0 35.0	0 35.9	0 36.9	0 38.0	0 39.3	0 40.6	0 42.1	0 43.8	20
50	0 37.4	0 38.3	0 39.3	0 40.3	0 41.5	0 42.9	0 44.3	0 46.0	0 47.8	10
2 0	0 40.5	0 41.4	0 42.5	0 43.7	0 45.0	0 46.4	0 48.0	0 49.8	0 51.7	22 0
10	0 43.5	0 44.5	0 45.6	0 46.9	0 48.3	0 49.8	0 51.5	0 53.4	0 55.5	21 50
20	0 46.4	0 47.5	0 48.7	0 50.1	0 51.6	0 53.2	0 55.0	0 57.0	0 59.3	40
2 30	0 49.2	0 50.4	0 51.7	0 53.1	0 54.7	0 56.4	0 58.3	1 0.5	1 2.9	21 30
40	0 52.0	0 53.2	0 54.6	0 56.0	0 57.7	0 59.6	1 1.6	1 3.8	1 6.3	20
50	0 54.6	0 55.9	0 57.3	0 58.9	1 0.6	1 2.6	1 4.7	1 7.0	1 9.7	10
3 0	0 57.1	0 58.5	1 0.0	1 1.6	1 3.4	1 5.4	1 7.7	1 10.1	1 12.9	21 0
10	0 59.5	1 0.9	1 2.5	1 4.2	1 6.1	1 8.2	1 10.5	1 13.1	1 15.9	20 50
20	1 1.8	1 3.3	1 4.9	1 6.7	1 8.6	1 10.8	1 13.2	1 15.9	1 18.8	40
3 30	1 4.0	1 5.5	1 7.2	1 9.0	1 11.0	1 13.3	1 15.8	1 18.5	1 21.6	20 30
40	1 6.1	1 7.6	1 9.3	1 11.2	1 13.3	1 15.6	1 18.2	1 21.0	1 24.2	20
50	1 8.0	1 9.6	1 11.4	1 13.3	1 15.4	1 17.8	1 20.4	1 23.4	1 26.6	10
4 0	1 9.8	1 11.4	1 13.2	1 15.2	1 17.4	1 19.8	1 22.5	1 25.5	1 28.9	20 0
10	1 11.4	1 13.1	1 15.0	1 17.0	1 19.2	1 21.7	1 24.5	1 27.5	1 31.0	19 50
20	1 13.0	1 14.7	1 16.6	1 18.6	1 20.9	1 23.4	1 26.3	1 29.4	1 32.9	40
4 30	1 14.3	1 16.1	1 18.0	1 20.1	1 22.4	1 25.0	1 27.9	1 31.0	1 34.6	19 30
40	1 15.6	1 17.3	1 19.3	1 21.4	1 23.8	1 26.4	1 29.3	1 32.5	1 36.1	20
50	1 16.7	1 18.4	1 20.4	1 22.6	1 25.0	1 27.6	1 30.6	1 33.8	1 37.4	10
5 0	1 17.6	1 19.4	1 21.4	1 23.6	1 26.0	1 28.7	1 31.7	1 34.9	1 38.6	19 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H.A.		32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H.A.	
h	m	°	°	°	°	°	°	°	°	°	h	m
5	0	1 17.6	1 19.4	1 21.4	1 23.6	1 26.0	1 28.7	1 31.7	1 34.9	1 38.6	19	0
	10	1 18.4	1 20.2	1 22.2	1 24.4	1 26.9	1 29.6	1 32.6	1 35.9	1 39.6	18	50
	20	1 19.0	1 20.9	1 22.9	1 25.1	1 27.6	1 30.3	1 33.3	1 36.6	1 40.3		40
5	30	1 19.5	1 21.4	1 23.4	1 25.6	1 28.1	1 30.8	1 33.8	1 37.2	1 40.9	18	30
	40	1 19.9	1 21.7	1 23.7	1 26.0	1 28.5	1 31.2	1 34.2	1 37.6	1 41.3		20
	50	1 20.1	1 21.9	1 23.9	1 26.2	1 28.6	1 31.4	1 34.4	1 37.8	1 41.5		10
6	0	1 20.1	1 21.9	1 24.0	1 26.2	1 28.7	1 31.4	1 34.4	1 37.8	1 41.5	18	0
	10	1 20.0	1 21.8	1 23.8	1 26.0	1 28.5	1 31.2	1 34.2	1 37.6	1 41.3	17	50
	20	1 19.7	1 21.5	1 23.5	1 25.7	1 28.2	1 30.9	1 33.9	1 37.2	1 40.9		40
6	30	1 19.3	1 21.1	1 23.1	1 25.3	1 27.7	1 30.4	1 33.4	1 36.7	1 40.3	17	30
	40	1 18.7	1 20.5	1 22.5	1 24.7	1 27.1	1 29.7	1 32.7	1 35.9	1 39.6		20
	50	1 18.0	1 19.8	1 21.7	1 23.9	1 26.2	1 28.9	1 31.8	1 35.0	1 38.6		10
7	0	1 17.1	1 18.9	1 20.8	1 22.9	1 25.3	1 27.9	1 30.7	1 33.9	1 37.5	17	0
	10	1 16.1	1 17.8	1 19.7	1 21.8	1 24.1	1 26.7	1 29.5	1 32.7	1 36.2	16	50
	20	1 14.9	1 16.6	1 18.5	1 20.6	1 22.8	1 25.4	1 28.1	1 31.2	1 34.7		40
7	30	1 13.6	1 15.3	1 17.1	1 19.1	1 21.4	1 23.9	1 26.6	1 29.6	1 33.0	16	30
	40	1 12.2	1 13.8	1 15.6	1 17.6	1 19.8	1 22.2	1 24.9	1 27.8	1 31.1		20
	50	1 10.6	1 12.2	1 14.0	1 15.9	1 18.0	1 20.4	1 23.0	1 25.9	1 29.1		10
8	0	1 8.9	1 10.5	1 12.2	1 14.1	1 16.1	1 18.4	1 21.0	1 23.8	1 26.9	16	0
	10	1 7.1	1 8.6	1 10.3	1 12.1	1 14.1	1 16.3	1 18.8	1 21.6	1 24.6	15	50
	20	1 5.1	1 6.6	1 8.2	1 10.0	1 11.9	1 14.1	1 16.5	1 19.2	1 22.1		40
8	30	1 3.1	1 4.5	1 6.0	1 7.7	1 9.6	1 11.7	1 14.0	1 16.6	1 19.4	15	30
	40	1 0.9	1 2.2	1 3.7	1 5.4	1 7.2	1 9.2	1 11.4	1 13.9	1 16.7		20
	50	0 58.6	0 59.9	1 1.3	1 2.9	1 4.6	1 6.6	1 8.7	1 11.1	1 13.7		10
9	0	0 56.1	0 57.4	0 58.8	1 0.3	1 2.0	1 3.8	1 5.9	1 8.1	1 10.7	15	0
	10	0 53.6	0 54.8	0 56.1	0 57.6	0 59.2	1 0.9	1 2.9	1 5.1	1 7.5	14	50
	20	0 51.0	0 52.1	0 53.4	0 54.7	0 56.3	0 57.9	0 59.8	1 1.8	1 4.1		40
9	30	0 48.3	0 49.3	0 50.5	0 51.8	0 53.3	0 54.8	0 56.6	0 58.5	1 0.7	14	30
	40	0 45.5	0 46.5	0 47.6	0 48.8	0 50.2	0 51.7	0 53.3	0 55.1	0 57.2		20
	50	0 42.6	0 43.5	0 44.6	0 45.7	0 47.0	0 48.4	0 49.9	0 51.6	0 53.5		10
10	0	0 39.6	0 40.5	0 41.5	0 42.5	0 43.7	0 45.0	0 46.4	0 48.0	0 49.8	14	0
	10	0 36.6	0 37.4	0 38.3	0 39.2	0 40.3	0 41.5	0 42.9	0 44.3	0 46.0	13	50
	20	0 33.5	0 34.2	0 35.0	0 35.9	0 36.9	0 38.0	0 39.2	0 40.6	0 42.1		40
10	30	0 30.3	0 31.0	0 31.7	0 32.5	0 33.4	0 34.4	0 35.5	0 36.7	0 38.1	13	30
	40	0 27.1	0 27.7	0 28.3	0 29.0	0 29.9	0 30.7	0 31.7	0 32.8	0 34.0		20
	50	0 23.8	0 24.3	0 24.9	0 25.5	0 26.3	0 27.0	0 27.9	0 28.8	0 29.9		10
11	0	0 20.5	0 20.9	0 21.4	0 22.0	0 22.6	0 23.3	0 24.0	0 24.8	0 25.7	13	0
	10	0 17.1	0 17.5	0 17.9	0 18.4	0 18.9	0 19.4	0 20.1	0 20.7	0 21.5	12	50
	20	0 13.7	0 14.0	0 14.4	0 14.7	0 15.1	0 15.6	0 16.1	0 16.6	0 17.2		40
11	30	0 10.3	0 10.5	0 10.8	0 11.1	0 11.4	0 11.7	0 12.1	0 12.5	0 13.0	12	30
	40	0 6.9	0 7.0	0 7.2	0 7.4	0 7.6	0 7.8	0 8.1	0 8.3	0 8.6		20
	50	0 3.5	0 3.5	0 3.6	0 3.7	0 3.8	0 3.9	0 4.0	0 4.2	0 4.3		10
12	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12	0

Lat. H.A.		48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H.A.	
h	m	°	°	°	°	°	°	°	°	°	h	m
0	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24	0
	10	0 4.5	0 4.7	0 4.9	0 5.2	0 5.5	0 5.8	0 6.1	0 6.3	0 6.6	23	50
	20	0 9.0	0 9.4	0 9.8	0 10.3	0 10.9	0 11.5	0 12.3	0 12.7	0 13.1		40
0	30	0 13.5	0 14.1	0 14.8	0 15.5	0 16.3	0 17.3	0 18.4	0 19.0	0 19.6	23	30
	40	0 18.0	0 18.8	0 19.6	0 20.6	0 21.7	0 23.0	0 24.4	0 25.2	0 26.1		20
	50	0 22.4	0 23.4	0 24.5	0 25.7	0 27.0	0 28.6	0 30.4	0 31.4	0 32.5		10
1	0	0 26.8	0 28.0	0 29.3	0 30.7	0 32.3	0 34.2	0 36.4	0 37.6	0 38.8	23	0

TABLE IV.

(699)

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0° to 12° the star is west of north, and for hour angles 12° to 24° it is east of north.]

H. A.	Lat.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat.	H. A.
	h m	°	°	°	°	°	°	°	°	°		h m
1	0	0 26.8	0 28.0	0 29.3	0 30.7	0 32.3	0 34.2	0 36.4	0 37.6	0 38.8	23	0
	10	0 31.2	0 32.5	0 34.0	0 35.6	0 37.5	0 39.7	0 42.2	0 43.6	0 45.1		22 50
	20	0 35.4	0 36.9	0 38.6	0 40.5	0 42.7	0 45.1	0 48.0	0 49.6	0 51.3		40
1	30	0 39.6	0 41.3	0 43.2	0 45.3	0 47.7	0 50.5	0 53.7	0 55.4	0 57.3	22	30
	40	0 43.8	0 45.6	0 47.7	0 50.0	0 52.7	0 55.7	0 59.3	1 1.2	1 3.3		20
	50	0 47.8	0 49.8	0 52.1	0 54.6	0 57.5	1 0.8	1 4.7	1 6.8	1 9.1		10
2	0	0 51.7	0 53.9	0 56.4	0 59.1	1 2.3	1 5.8	1 10.0	1 12.3	1 14.7	22	0
	10	0 55.5	0 57.9	1 0.5	1 3.5	1 6.9	1 10.7	1 15.1	1 17.6	1 20.2	21	50
	20	0 59.3	1 1.8	1 4.6	1 7.7	1 11.3	1 15.4	1 20.1	1 22.8	1 25.6		40
2	30	1 2.9	1 5.5	1 8.5	1 11.9	1 15.7	1 20.0	1 25.0	1 27.8	1 30.7	21	30
	40	1 6.3	1 9.1	1 12.3	1 15.8	1 19.8	1 24.4	1 29.7	1 32.6	1 35.7		20
	50	1 9.7	1 12.6	1 15.9	1 19.6	1 23.8	1 28.6	1 34.1	1 37.2	1 40.5		10
3	0	1 12.9	1 16.0	1 19.4	1 23.3	1 27.7	1 32.7	1 38.4	1 41.6	1 45.0	21	0
	10	1 15.9	1 19.1	1 22.7	1 26.8	1 31.3	1 36.5	1 42.5	1 45.8	1 49.4	20	50
	20	1 18.8	1 22.2	1 25.9	1 30.1	1 34.8	1 40.2	1 46.4	1 49.8	1 53.5		40
3	30	1 21.6	1 25.0	1 28.9	1 33.2	1 38.1	1 43.6	1 50.0	1 53.6	1 57.4	20	30
	40	1 24.2	1 27.7	1 31.7	1 36.1	1 41.2	1 46.9	1 53.5	1 57.1	2 1.0		20
	50	1 26.6	1 30.2	1 34.3	1 38.9	1 44.0	1 49.9	1 56.7	2 0.4	2 4.5		10
4	0	1 28.9	1 32.6	1 36.7	1 41.4	1 46.7	1 52.7	1 59.7	2 3.5	2 7.6	20	0
	10	1 31.0	1 34.7	1 39.0	1 43.8	1 49.2	1 55.3	2 2.4	2 6.3	2 10.5	19	50
	20	1 32.9	1 36.7	1 41.0	1 45.9	1 51.4	1 57.7	2 4.9	2 8.9	2 13.2		40
4	30	1 34.6	1 38.5	1 42.9	1 47.9	1 53.5	1 59.8	2 7.1	2 11.2	2 15.5	19	30
	40	1 36.1	1 40.1	1 44.6	1 49.6	1 55.3	2 1.7	2 9.1	2 13.2	2 17.6		20
	50	1 37.4	1 41.5	1 46.0	1 51.1	1 56.9	2 3.4	2 10.9	2 15.0	2 19.5		10
5	0	1 38.6	1 42.7	1 47.3	1 52.4	1 58.2	2 4.8	2 12.3	2 16.5	2 21.0	19	0
	10	1 39.6	1 43.7	1 48.3	1 53.5	1 59.3	2 6.0	2 13.6	2 17.8	2 22.3	18	50
	20	1 40.3	1 44.5	1 49.1	1 54.3	2 0.2	2 6.9	2 14.5	2 18.8	2 23.3		40
5	30	1 40.9	1 45.1	1 49.7	1 55.0	2 0.9	2 7.6	2 15.2	2 19.5	2 24.1	18	30
	40	1 41.3	1 45.5	1 50.1	1 55.4	2 1.3	2 8.0	2 15.7	2 19.9	2 24.5		20
	50	1 41.5	1 45.7	1 50.3	1 55.6	2 1.5	2 8.2	2 15.9	2 20.1	2 24.7		10
6	0	1 41.5	1 45.7	1 50.3	1 55.6	2 1.5	2 8.2	2 15.8	2 20.0	2 24.6	18	0
	10	1 41.3	1 45.4	1 50.1	1 55.3	2 1.2	2 7.9	2 15.5	2 19.7	2 24.2	17	50
	20	1 40.9	1 45.0	1 49.6	1 54.8	2 0.7	2 7.3	2 14.9	2 19.1	2 23.6		40
6	30	1 40.3	1 44.4	1 49.0	1 54.2	2 0.0	2 6.5	2 14.0	2 18.2	2 22.7	17	30
	40	1 39.6	1 43.6	1 48.2	1 53.3	1 59.0	2 5.5	2 12.9	2 17.0	2 21.5		20
	50	1 38.6	1 42.6	1 47.1	1 52.1	1 57.8	2 4.3	2 11.6	2 15.6	2 20.0		10
7	0	1 37.5	1 41.4	1 45.9	1 50.8	1 56.4	2 2.8	2 10.0	2 14.0	2 18.3	17	0
	10	1 36.2	1 40.0	1 44.4	1 49.3	1 54.8	2 1.1	2 8.2	2 12.1	2 16.4	16	50
	20	1 34.7	1 38.5	1 42.8	1 47.6	1 53.0	1 59.1	2 6.1	2 10.0	2 14.2		40
7	30	1 33.0	1 36.7	1 40.9	1 45.6	1 51.0	1 57.0	2 3.8	2 7.6	2 11.7	16	30
	40	1 31.1	1 34.8	1 38.9	1 43.5	1 48.7	1 54.6	2 1.3	2 5.0	2 9.0		20
	50	1 29.1	1 32.7	1 36.7	1 41.2	1 46.3	1 52.0	1 58.6	2 2.2	2 6.1		10
8	0	1 26.9	1 30.4	1 34.3	1 38.7	1 43.6	1 49.2	1 55.6	1 59.2	2 3.0	16	0
	10	1 24.6	1 28.0	1 31.8	1 36.0	1 40.8	1 46.3	1 52.5	1 55.9	1 59.6	15	50
	20	1 22.1	1 25.4	1 29.1	1 33.2	1 37.8	1 43.1	1 49.1	1 52.4	1 56.0		40
8	30	1 19.4	1 22.6	1 26.2	1 30.2	1 34.6	1 39.7	1 45.5	1 48.7	1 52.2	15	30
	40	1 16.7	1 19.7	1 23.1	1 27.0	1 31.3	1 36.2	1 41.8	1 44.9	1 48.2		20
	50	1 13.7	1 16.7	1 19.9	1 23.6	1 27.8	1 32.5	1 37.9	1 40.8	1 44.0		10
9	0	1 10.7	1 13.5	1 16.6	1 20.1	1 24.1	1 28.6	1 33.8	1 36.6	1 39.7	15	0
	10	1 7.5	1 10.2	1 13.1	1 16.5	1 20.3	1 24.6	1 29.5	1 32.2	1 35.1	14	50
	20	1 4.1	1 6.7	1 9.5	1 12.7	1 16.3	1 20.4	1 25.1	1 27.6	1 30.4		40
9	30	1 0.7	1 3.1	1 5.8	1 8.8	1 12.2	1 16.1	1 20.5	1 22.9	1 25.5	14	30
	40	0 57.2	0 59.4	1 2.0	1 4.8	1 8.0	1 11.6	1 15.8	1 18.1	1 20.5		20
	50	0 53.5	0 55.6	0 58.0	1 0.7	1 3.6	1 7.0	1 10.9	1 13.1	1 15.4		10
10	0	0 49.8	0 51.8	0 53.9	0 56.4	0 59.2	1 2.3	1 6.0	1 8.0	1 10.1	14	0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H.A.	48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H.A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
10 0	0 49.8	0 51.8	0 53.9	0 56.4	0 59.2	1 2.3	1 6.0	1 8.0	1 10.1	14 0
10 10	0 46.0	0 47.8	0 49.8	0 52.1	0 54.6	0 57.5	1 0.9	1 2.7	1 4.7	13 50
10 20	0 42.1	0 43.7	0 45.6	0 47.6	0 50.0	0 52.6	0 55.7	0 57.4	0 59.2	40
10 30	0 38.1	0 39.6	0 41.2	0 43.1	0 45.2	0 47.6	0 50.4	0 51.9	0 53.5	13 30
10 40	0 34.0	0 35.3	0 36.8	0 38.5	0 40.4	0 42.5	0 45.0	0 46.4	0 47.8	20
10 50	0 29.9	0 31.1	0 32.4	0 33.8	0 35.5	0 37.4	0 39.6	0 40.7	0 42.0	10
11 0	0 25.7	0 26.7	0 27.9	0 29.1	0 30.5	0 32.2	0 34.0	0 35.0	0 36.1	13 0
11 10	0 21.5	0 22.3	0 23.3	0 24.3	0 25.5	0 26.9	0 28.5	0 29.3	0 30.2	12 50
11 20	0 17.2	0 17.9	0 18.7	0 19.5	0 20.5	0 21.6	0 22.8	0 23.5	0 24.2	40
11 30	0 13.0	0 13.5	0 14.0	0 14.7	0 15.4	0 16.2	0 17.2	0 17.7	0 18.2	12 30
11 40	0 8.6	0 9.0	0 9.4	0 9.8	0 10.3	0 10.8	0 11.5	0 11.8	0 12.2	20
11 50	0 4.3	0 4.5	0 4.7	0 4.9	0 5.1	0 5.4	0 5.7	0 5.9	0 6.1	10
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

Lat. H.A.	62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat. H.A.
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
0 10	0 6.6	0 6.8	0 7.0	0 7.3	0 7.6	0 8.0	0 8.3	0 8.7	0 9.2	23 50
0 20	0 13.1	0 13.6	0 14.1	0 14.6	0 15.2	0 15.9	0 16.6	0 17.4	0 18.3	40
0 30	0 19.6	0 20.3	0 21.1	0 21.9	0 22.8	0 23.8	0 24.9	0 26.1	0 27.4	23 30
0 40	0 26.1	0 27.0	0 28.0	0 29.1	0 30.3	0 31.6	0 33.1	0 34.7	0 36.4	20
0 50	0 32.5	0 33.7	0 34.9	0 36.3	0 37.8	0 39.4	0 41.2	0 43.2	0 45.4	10
1 0	0 38.8	0 40.2	0 41.7	0 43.4	0 45.2	0 47.1	0 49.2	0 51.6	0 54.2	23 0
1 10	0 45.1	0 46.7	0 48.5	0 50.4	0 52.4	0 54.7	0 57.2	0 59.9	1 3.0	22 50
1 20	0 51.3	0 53.1	0 55.1	0 57.2	0 59.6	1 2.2	1 5.0	1 8.1	1 11.6	40
1 30	0 57.3	0 59.4	1 1.6	1 4.0	1 6.6	1 9.5	1 12.7	1 16.1	1 20.0	22 30
1 40	1 3.3	1 5.5	1 8.0	1 10.6	1 13.5	1 16.7	1 20.2	1 24.0	1 28.2	20
1 50	1 9.1	1 11.5	1 14.2	1 17.1	1 20.2	1 23.7	1 27.5	1 31.7	1 36.3	10
2 0	1 14.7	1 17.4	1 20.3	1 23.4	1 26.8	1 30.5	1 34.6	1 39.2	1 44.2	22 0
2 10	1 20.2	1 23.1	1 26.2	1 29.5	1 33.2	1 37.2	1 41.6	1 46.4	1 51.8	21 50
2 20	1 25.6	1 28.6	1 31.9	1 35.5	1 39.4	1 43.6	1 48.3	1 53.5	1 59.2	40
2 30	1 30.7	1 33.9	1 37.4	1 41.2	1 45.3	1 49.8	1 54.8	2 0.2	2 6.3	21 30
2 40	1 35.7	1 39.1	1 42.7	1 46.7	1 51.1	1 55.8	2 1.0	2 6.8	2 13.1	20
2 50	1 40.5	1 44.0	1 47.8	1 52.0	1 56.6	2 1.6	2 7.0	2 13.0	2 19.7	10
3 0	1 45.0	1 48.7	1 52.7	1 57.1	2 1.9	2 7.1	2 12.7	2 19.0	2 26.0	21 0
3 10	1 49.4	1 53.2	1 57.4	2 1.9	2 6.9	2 12.3	2 18.2	2 24.7	2 31.9	20 50
3 20	1 53.5	1 57.5	2 1.8	2 6.5	2 11.6	2 17.2	2 23.3	2 30.1	2 37.5	40
3 30	1 57.4	2 1.5	2 6.0	2 10.8	2 16.1	2 21.9	2 28.2	2 35.1	2 42.8	20 30
3 40	2 1.0	2 5.3	2 9.9	2 14.9	2 20.3	2 26.2	2 32.7	2 39.9	2 47.8	20
3 50	2 4.5	2 8.8	2 13.5	2 18.6	2 24.2	2 30.3	2 37.0	2 44.3	2 52.4	10
4 0	2 7.6	2 12.1	2 16.9	2 22.1	2 27.8	2 34.0	2 40.9	2 48.4	2 56.6	20 0
4 10	2 10.5	2 15.1	2 20.0	2 25.3	2 31.1	2 37.5	2 44.4	2 52.1	3 0.5	19 50
4 20	2 13.2	2 17.8	2 22.8	2 28.2	2 34.1	2 40.6	2 47.7	2 55.5	3 4.0	40
4 30	2 15.5	2 20.2	2 25.3	2 30.8	2 36.8	2 43.4	2 50.6	2 58.5	3 7.2	19 30
4 40	2 17.6	2 22.4	2 27.5	2 33.1	2 39.2	2 45.9	2 53.1	3 1.1	3 10.0	20
4 50	2 19.5	2 24.3	2 29.5	2 35.2	2 41.3	2 48.0	2 55.4	3 3.4	3 12.4	10
5 0	2 21.0	2 25.9	2 31.2	2 36.9	2 43.1	2 49.8	2 57.2	3 5.4	3 14.4	19 0
5 10	2 22.3	2 27.2	2 32.5	2 38.2	2 44.5	2 51.3	2 58.8	3 7.0	3 16.0	18 50
5 20	2 23.3	2 28.2	2 33.6	2 39.3	2 45.6	2 52.5	2 59.9	3 8.2	3 17.2	40
5 30	2 24.1	2 29.0	2 34.3	2 40.1	2 46.4	2 53.3	3 0.8	3 9.0	3 18.1	18 30
5 40	2 24.5	2 29.5	2 34.8	2 40.6	2 46.9	2 53.7	3 1.2	3 9.5	3 18.6	20
5 50	2 24.7	2 29.6	2 35.0	2 40.8	2 47.0	2 53.9	3 1.4	3 9.6	3 18.7	10
6 0	2 24.6	2 29.5	2 34.8	2 40.6	2 46.9	2 53.7	3 1.2	3 9.4	3 18.4	18 0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1917.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.		62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat.	H. A.	
H. A.												H. A.	
h m												h m	
6	0	2 24.6	2 29.5	2 34.8	2 40.6	2 46.9	2 53.7	3 1.2	3 9.4	3 18.4	18	0	
	10	2 24.2	2 29.1	2 34.4	2 40.2	2 46.4	2 53.2	3 0.6	3 8.7	3 17.7		17	50
	20	2 23.6	2 28.5	2 33.7	2 39.4	2 45.6	2 52.3	2 59.7	3 7.8	3 16.7		40	
6	30	2 22.7	2 27.5	2 32.7	2 38.4	2 44.5	2 51.2	2 58.5	3 6.5	3 15.3	17	30	
	40	2 21.5	2 26.3	2 31.4	2 37.0	2 43.1	2 49.7	2 56.9	3 4.8	3 13.5		20	
	50	2 20.0	2 24.8	2 29.9	2 35.4	2 41.4	2 47.9	2 55.0	3 2.8	3 11.4		10	
7	0	2 18.3	2 23.0	2 28.0	2 33.5	2 39.4	2 45.8	2 52.8	3 0.5	3 9.0	17	0	
	10	2 16.4	2 21.0	2 25.9	2 31.3	2 37.1	2 43.4	2 50.3	2 57.8	3 6.2		16	50
	20	2 14.2	2 18.7	2 23.5	2 28.8	2 34.5	2 40.7	2 47.4	2 54.9	3 3.0		40	
7	30	2 11.7	2 16.1	2 20.9	2 26.0	2 31.6	2 37.7	2 44.3	2 51.6	2 59.6	16	30	
	40	2 9.0	2 13.3	2 18.0	2 23.0	2 28.5	2 34.4	2 40.9	2 48.0	2 55.8		20	
	50	2 6.1	2 10.3	2 14.8	2 19.7	2 25.1	2 30.8	2 37.2	2 44.1	2 51.7		10	
8	0	2 3.0	2 7.1	2 11.5	2 16.2	2 21.4	2 27.0	2 33.2	2 39.9	2 47.3	16	0	
	10	1 59.6	2 3.6	2 7.8	2 12.5	2 17.5	2 23.0	2 28.9	2 35.4	2 42.6		15	50
	20	1 56.0	1 59.8	2 4.0	2 8.5	2 13.3	2 18.6	2 24.4	2 30.7	2 37.6		40	
8	30	1 52.2	1 55.9	1 59.9	2 4.2	2 8.9	2 14.0	2 19.6	2 25.7	2 32.4	15	30	
	40	1 48.2	1 51.8	1 55.6	1 59.8	2 4.3	2 9.2	2 14.6	2 20.5	2 26.9		20	
	50	1 44.0	1 47.5	1 51.2	1 55.2	1 59.5	2 4.2	2 9.4	2 15.0	2 21.2		10	
9	0	1 39.7	1 42.9	1 46.5	1 50.3	1 54.5	1 59.0	2 3.9	2 9.3	2 15.2	15	0	
	10	1 35.1	1 38.2	1 41.6	1 45.3	1 49.2	1 53.5	1 58.2	2 3.3	2 8.9		14	50
	20	1 30.4	1 33.4	1 36.6	1 40.0	1 43.8	1 47.9	1 52.3	1 57.2	2 2.5		40	
9	30	1 25.5	1 28.3	1 31.4	1 34.6	1 38.2	1 42.0	1 46.2	1 50.8	1 55.9	14	30	
	40	1 20.5	1 23.1	1 26.0	1 29.1	1 32.4	1 36.0	1 40.0	1 44.3	1 49.0		20	
	50	1 15.4	1 17.8	1 20.5	1 23.4	1 26.5	1 29.9	1 33.6	1 37.6	1 42.0		10	
10	0	1 10.1	1 12.4	1 14.8	1 17.5	1 20.4	1 23.5	1 27.0	1 30.7	1 34.8	14	0	
	10	1 4.7	1 6.8	1 9.1	1 11.5	1 14.2	1 17.1	1 20.2	1 23.7	1 27.5		13	50
	20	0 59.2	1 1.1	1 3.2	1 5.4	1 7.8	1 10.5	1 13.4	1 16.5	1 20.0		40	
10	30	0 53.5	0 55.8	0 57.2	0 59.2	1 1.4	1 3.8	1 6.4	1 9.2	1 12.4	13	30	
	40	0 47.8	0 49.4	0 51.1	0 52.9	0 54.8	0 57.0	0 59.3	1 1.8	1 4.6		20	
	50	0 42.0	0 43.4	0 44.9	0 46.5	0 48.2	0 50.1	0 52.1	0 54.3	0 56.8		10	
11	0	0 36.1	0 37.3	0 38.6	0 40.0	0 41.5	0 43.1	0 44.8	0 46.7	0 48.8	13	0	
	10	0 30.2	0 31.2	0 32.3	0 33.4	0 34.7	0 36.0	0 37.5	0 39.1	0 40.8		12	50
	20	0 24.2	0 25.0	0 25.9	0 26.8	0 27.8	0 28.9	0 30.0	0 31.3	0 32.7		40	
11	30	0 18.2	0 18.8	0 19.4	0 20.1	0 20.9	0 21.7	0 22.6	0 23.5	0 24.6	12	30	
	40	0 12.2	0 12.6	0 13.0	0 13.4	0 13.9	0 14.5	0 15.1	0 15.7	0 16.4		20	
	50	0 6.1	0 6.3	0 6.5	0 6.7	0 7.0	0 7.2	0 7.5	0 7.9	0 8.2		10	
12	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12	0	

TABLE IVa.

Table IV has been computed for a declination of 88° 52' 5". For other declinations of Polaris the correction given below should be applied to the Azimuth taken from Table IV.

Azimuth.		0'	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'	Azimuth.	
Decl.													Decl.	
° ' "													° ' "	
88 51 40	0.0	+0.1	+0.2	+0.4	+0.5	+0.6	+0.7	+0.8	+1.0	+1.1	+1.2	88 51 40		
88 51 45	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 51 45		
88 51 50	0.0	+0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	88 51 50		
88 51 55	0.0	0.0	+0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	88 51 55		
88 52 0	0.0	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	88 52 0		
88 52 5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	88 52 5		
88 52 10	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	88 52 10		
88 52 15	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5	88 52 15		
88 52 20	0.0	-0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7	88 52 20		
88 52 25	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	88 52 25		
88 52 30	0.0	-0.1	-0.2	-0.4	-0.5	-0.6	-0.7	-0.8	-1.0	-1.1	-1.2	88 52 30		

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Decl. Lat.							Variation for—	
	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	1' of Lat.	1" of s.
10 0	1 9 23.3	1 9 13.1	1 9 2.9	1 8 52.8	1 8 42.6	1 8 32.5	+0.21	-1.02
10 20	1 9 27.6	1 9 17.4	1 9 7.3	1 8 57.1	1 8 46.9	1 8 36.8	0.22	1.02
10 40	1 9 32.1	1 9 21.9	1 9 11.8	1 9 1.6	1 8 51.4	1 8 41.2	0.23	1.02
11 0	1 9 36.8	1 9 26.6	1 9 16.4	1 9 6.2	1 8 56.0	1 8 45.8	0.24	1.02
11 20	1 9 41.6	1 9 31.4	1 9 21.2	1 9 11.0	1 9 0.8	1 8 50.6	0.24	1.02
11 40	1 9 46.5	1 9 36.3	1 9 26.1	1 9 15.9	1 9 5.7	1 8 55.5	+0.25	-1.02
12 0	1 9 51.6	1 9 41.4	1 9 31.2	1 9 20.9	1 9 10.7	1 9 0.5	0.26	1.02
12 20	1 9 56.9	1 9 46.6	1 9 36.4	1 9 26.2	1 9 15.9	1 9 5.7	0.27	1.02
12 40	1 10 2.3	1 9 52.0	1 9 41.8	1 9 31.5	1 9 21.3	1 9 11.0	0.27	1.03
13 0	1 10 7.9	1 9 57.6	1 9 47.3	1 9 37.1	1 9 26.8	1 9 16.5	0.28	1.03
13 20	1 10 13.6	1 10 3.3	1 9 53.0	1 9 42.8	1 9 32.5	1 9 22.2	+0.29	-1.03
13 40	1 10 19.5	1 10 9.2	1 9 58.9	1 9 48.6	1 9 38.3	1 9 28.0	0.30	1.03
14 0	1 10 25.5	1 10 15.2	1 10 4.9	1 9 54.6	1 9 44.3	1 9 34.0	0.30	1.03
14 20	1 10 31.7	1 10 21.4	1 10 11.1	1 10 0.8	1 9 50.5	1 9 40.1	0.31	1.03
14 40	1 10 38.1	1 10 27.8	1 10 17.4	1 10 7.1	1 9 56.8	1 9 46.4	0.32	1.03
15 0	1 10 44.6	1 10 34.3	1 10 23.9	1 10 13.6	1 10 3.2	1 9 52.9	+0.33	-1.03
15 20	1 10 51.4	1 10 41.0	1 10 30.6	1 10 20.2	1 10 9.9	1 9 59.5	0.34	1.04
15 40	1 10 58.2	1 10 47.8	1 10 37.4	1 10 27.1	1 10 16.7	1 10 6.3	0.34	1.04
16 0	1 11 5.2	1 10 54.8	1 10 44.4	1 10 34.0	1 10 23.6	1 10 13.2	0.35	1.04
16 20	1 11 12.4	1 11 2.0	1 10 51.6	1 10 41.2	1 10 30.8	1 10 20.3	0.36	1.04
16 40	1 11 19.8	1 11 9.4	1 10 58.9	1 10 48.5	1 10 38.1	1 10 27.6	+0.37	-1.04
17 0	1 11 27.4	1 11 16.9	1 11 6.4	1 10 56.0	1 10 45.5	1 10 35.1	0.38	1.05
17 20	1 11 35.1	1 11 24.6	1 11 14.1	1 11 3.6	1 10 53.2	1 10 42.7	0.39	1.05
17 40	1 11 43.0	1 11 32.5	1 11 22.0	1 11 11.5	1 11 1.0	1 10 50.5	0.40	1.05
18 0	1 11 51.0	1 11 40.5	1 11 30.0	1 11 19.5	1 11 9.0	1 10 58.5	0.40	1.05
18 20	1 11 59.3	1 11 48.7	1 11 38.2	1 11 27.7	1 11 17.1	1 11 6.6	+0.41	-1.05
18 40	1 12 7.7	1 11 57.1	1 11 46.6	1 11 36.0	1 11 25.5	1 11 14.9	0.42	1.06
19 0	1 12 16.3	1 12 5.7	1 11 55.1	1 11 44.5	1 11 34.0	1 11 23.4	0.43	1.06
19 20	1 12 25.1	1 12 14.5	1 12 3.9	1 11 53.3	1 11 42.7	1 11 32.1	0.44	1.06
19 40	1 12 34.0	1 12 23.4	1 12 12.8	1 12 2.2	1 11 51.5	1 11 40.9	0.45	1.06
20 0	1 12 43.2	1 12 32.5	1 12 21.9	1 12 11.2	1 12 0.6	1 11 50.0	+0.46	-1.06
20 20	1 12 52.5	1 12 41.8	1 12 31.2	1 12 20.5	1 12 9.8	1 11 59.2	0.47	1.07
20 40	1 13 2.0	1 12 51.3	1 12 40.7	1 12 30.0	1 12 19.3	1 12 8.6	0.48	1.07
21 0	1 13 11.7	1 13 1.0	1 12 50.3	1 12 39.6	1 12 28.9	1 12 18.2	0.49	1.07
21 20	1 13 21.6	1 13 10.9	1 13 0.2	1 12 49.4	1 12 38.7	1 12 28.0	0.50	1.07
21 40	1 13 31.7	1 13 21.0	1 13 10.2	1 12 59.5	1 12 48.7	1 12 37.9	+0.51	-1.08
22 0	1 13 42.0	1 13 31.2	1 13 20.5	1 13 9.7	1 12 58.9	1 12 48.1	0.52	1.08
22 20	1 13 52.5	1 13 41.7	1 13 30.9	1 13 20.1	1 13 9.3	1 12 58.5	0.53	1.08
22 40	1 14 3.2	1 13 52.4	1 13 41.6	1 13 30.7	1 13 19.9	1 13 9.0	0.54	1.08
23 0	1 14 14.1	1 14 3.3	1 13 52.4	1 13 41.5	1 13 30.7	1 13 19.8	0.55	1.09
23 20	1 14 25.2	1 14 14.3	1 14 3.4	1 13 52.6	1 13 41.7	1 13 30.8	+0.56	-1.09
23 40	1 14 36.5	1 14 25.6	1 14 14.7	1 14 3.8	1 13 52.9	1 13 42.0	0.57	1.09
24 0	1 14 48.1	1 14 37.1	1 14 26.2	1 14 15.2	1 14 4.3	1 13 53.3	0.58	1.10
24 20	1 14 59.8	1 14 48.8	1 14 37.9	1 14 26.9	1 14 15.9	1 14 4.9	0.59	1.10
24 40	1 15 11.8	1 15 0.8	1 14 49.7	1 14 38.7	1 14 27.7	1 14 16.7	0.60	1.10
25 0	1 15 23.9	1 15 12.9	1 15 1.8	1 14 50.8	1 14 39.8	1 14 28.7	+0.61	-1.10
25 20	1 15 36.3	1 15 25.2	1 15 14.2	1 15 3.1	1 14 52.0	1 14 41.0	0.62	1.11
25 40	1 15 48.9	1 15 37.8	1 15 26.7	1 15 15.6	1 15 4.5	1 14 53.4	0.63	1.11
26 0	1 16 1.7	1 15 50.6	1 15 39.5	1 15 28.4	1 15 17.2	1 15 6.1	0.64	1.11
26 20	1 16 14.8	1 16 3.6	1 15 52.5	1 15 41.3	1 15 30.2	1 15 19.0	0.65	1.12
26 40	1 16 28.1	1 16 16.9	1 16 5.7	1 15 54.5	1 15 43.3	1 15 32.1	+0.67	-1.12
27 0	1 16 41.6	1 16 30.4	1 16 19.2	1 16 7.9	1 15 56.7	1 15 45.5	0.68	1.12
27 20	1 16 55.4	1 16 44.1	1 16 32.9	1 16 21.6	1 16 10.3	1 15 59.1	0.69	1.13
27 40	1 17 9.4	1 16 58.1	1 16 46.8	1 16 35.5	1 16 24.2	1 16 12.9	0.70	1.13
28 0	1 17 23.6	1 17 12.3	1 17 1.0	1 16 49.6	1 16 38.3	1 16 27.0	0.71	1.13
28 20	1 17 38.1	1 17 26.8	1 17 15.4	1 17 4.0	1 16 52.7	1 16 41.3	+0.73	-1.14
28 40	1 17 52.8	1 17 41.5	1 17 30.1	1 17 18.7	1 17 7.3	1 16 55.9	0.74	1.14
29 0	1 18 7.8	1 17 56.4	1 17 45.0	1 17 33.5	1 17 22.1	1 17 10.7	0.75	1.14
29 20	1 18 23.1	1 18 11.6	1 18 0.2	1 17 48.5	1 17 37.2	1 17 25.7	0.76	1.15
29 40	1 18 38.6	1 18 27.1	1 18 15.6	1 18 4.1	1 17 52.6	1 17 41.0	0.78	1.15
30 0	1 18 54.4	1 18 42.8	1 18 31.3	1 18 19.7	1 18 8.2	1 17 56.6	+0.79	-1.16

TABLE V.

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AZIMUTH OF POLARIS AT ELONGATION, 1917.

Decl. Lat.	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	Variation for—	
							1' of Lat.	1" of δ .
30 0	1 18 54.4	1 18 42.8	1 18 31.3	1 18 19.7	1 18 8.2	1 17 56.6	+0.79	-1.16
30 10	1 19 2.4	1 18 50.8	1 18 39.2	1 18 27.7	1 18 16.1	1 18 4.5	0.80	1.16
30 20	1 19 10.4	1 18 58.8	1 18 47.2	1 18 35.7	1 18 24.1	1 18 12.5	0.80	1.16
30 30	1 19 18.5	1 19 6.9	1 18 55.3	1 18 43.7	1 18 32.1	1 18 20.5	0.81	1.16
30 40	1 19 26.7	1 19 15.1	1 19 3.5	1 18 51.8	1 18 40.2	1 18 28.6	0.82	1.16
30 50	1 19 35.0	1 19 23.3	1 19 11.7	1 19 0.0	1 18 48.4	1 18 36.8	+0.82	-1.16
31 0	1 19 43.3	1 19 31.6	1 19 20.0	1 19 8.3	1 18 56.6	1 18 45.0	0.83	1.17
31 10	1 19 51.7	1 19 40.0	1 19 28.3	1 19 16.6	1 19 4.9	1 18 53.3	0.84	1.17
31 20	1 20 0.2	1 19 48.5	1 19 36.8	1 19 25.0	1 19 13.3	1 19 1.6	0.85	1.17
31 30	1 20 8.7	1 19 57.0	1 19 45.3	1 19 33.5	1 19 21.8	1 19 10.1	0.85	1.17
31 40	1 20 17.3	1 20 5.6	1 19 53.8	1 19 42.1	1 19 30.3	1 19 18.6	+0.86	-1.17
31 50	1 20 26.0	1 20 14.2	1 20 2.5	1 19 50.7	1 19 38.9	1 19 27.2	0.87	1.18
32 0	1 20 34.8	1 20 23.0	1 20 11.2	1 19 59.4	1 19 47.6	1 19 35.8	0.87	1.18
32 10	1 20 43.6	1 20 31.8	1 20 19.9	1 20 8.1	1 19 56.3	1 19 44.5	0.88	1.18
32 20	1 20 52.5	1 20 40.6	1 20 28.8	1 20 17.0	1 20 5.1	1 19 53.3	0.89	1.18
32 30	1 21 1.5	1 20 49.6	1 20 37.7	1 20 25.9	1 20 14.0	1 20 2.2	+0.90	-1.19
32 40	1 21 10.5	1 20 58.6	1 20 46.7	1 20 34.9	1 20 23.0	1 20 11.1	0.90	1.19
32 50	1 21 19.6	1 21 7.7	1 20 55.8	1 20 43.9	1 20 32.0	1 20 20.1	0.91	1.19
33 0	1 21 28.8	1 21 16.9	1 21 5.0	1 20 53.1	1 20 41.1	1 20 29.2	0.92	1.19
33 10	1 21 38.1	1 21 26.2	1 21 14.2	1 21 2.3	1 20 50.3	1 20 38.4	0.92	1.19
33 20	1 21 47.4	1 21 35.5	1 21 23.5	1 21 11.5	1 20 59.6	1 20 47.6	+0.93	-1.20
33 30	1 21 56.9	1 21 44.9	1 21 32.9	1 21 20.9	1 21 8.9	1 20 56.9	0.94	1.20
33 40	1 22 6.4	1 21 54.4	1 21 42.4	1 21 30.3	1 21 18.3	1 21 6.3	0.95	1.20
33 50	1 22 16.0	1 22 3.9	1 21 51.9	1 21 39.9	1 21 27.8	1 21 15.8	0.96	1.20
34 0	1 22 25.6	1 22 13.6	1 22 1.5	1 21 49.5	1 21 37.4	1 21 25.3	0.96	1.21
34 10	1 22 35.4	1 22 23.3	1 22 11.2	1 21 59.1	1 21 47.0	1 21 34.9	+0.97	-1.21
34 20	1 22 45.2	1 22 33.1	1 22 21.0	1 22 8.9	1 21 56.8	1 21 44.6	0.98	1.21
34 30	1 22 55.1	1 22 43.0	1 22 30.9	1 22 18.7	1 22 6.6	1 21 54.4	0.99	1.21
34 40	1 23 5.1	1 22 53.0	1 22 40.8	1 22 28.6	1 22 16.5	1 22 4.3	1.00	1.22
34 50	1 23 15.2	1 23 3.0	1 22 50.8	1 22 38.6	1 22 26.5	1 22 14.3	1.00	1.22
35 0	1 23 25.3	1 23 13.1	1 23 0.9	1 22 48.7	1 22 36.5	1 22 24.3	+1.01	-1.22
35 10	1 23 35.6	1 23 23.4	1 23 11.1	1 22 58.9	1 22 46.6	1 22 34.4	1.02	1.22
35 20	1 23 45.9	1 23 33.6	1 23 21.4	1 23 9.1	1 22 56.9	1 22 44.6	1.03	1.23
35 30	1 23 56.3	1 23 44.0	1 23 31.7	1 23 19.5	1 23 7.2	1 22 54.9	1.04	1.23
35 40	1 24 6.8	1 23 54.5	1 23 42.2	1 23 29.9	1 23 17.6	1 23 5.3	1.05	1.23
35 50	1 24 17.4	1 24 5.0	1 23 52.7	1 23 40.4	1 23 28.0	1 23 15.7	+1.06	-1.23
36 0	1 24 28.0	1 24 15.7	1 24 3.3	1 23 51.0	1 23 38.6	1 23 26.2	1.06	1.24
36 10	1 24 38.8	1 24 26.4	1 24 14.0	1 24 1.6	1 23 49.3	1 23 36.9	1.07	1.24
36 20	1 24 49.6	1 24 37.2	1 24 24.8	1 24 12.4	1 24 0.0	1 23 47.6	1.08	1.24
36 30	1 25 0.6	1 24 48.2	1 24 35.7	1 24 23.3	1 24 10.8	1 23 58.4	1.09	1.24
36 40	1 25 11.6	1 24 59.2	1 24 46.7	1 24 34.2	1 24 21.7	1 24 9.3	+1.10	-1.25
36 50	1 25 22.7	1 25 10.2	1 24 57.7	1 24 45.2	1 24 32.7	1 24 20.2	1.11	1.25
37 0	1 25 34.0	1 25 21.4	1 25 8.9	1 24 56.4	1 24 43.9	1 24 31.3	1.12	1.25
37 10	1 25 45.2	1 25 32.7	1 25 20.1	1 25 7.6	1 24 55.1	1 24 42.5	1.13	1.25
37 20	1 25 56.6	1 25 44.1	1 25 31.5	1 25 18.9	1 25 6.3	1 24 53.8	1.14	1.26
37 30	1 26 8.1	1 25 55.5	1 25 42.9	1 25 30.3	1 25 17.7	1 25 5.1	+1.15	-1.26
37 40	1 26 19.7	1 26 7.1	1 25 54.5	1 25 41.8	1 25 29.2	1 25 16.5	1.16	1.26
37 50	1 26 31.4	1 26 18.7	1 26 6.1	1 25 53.4	1 25 40.8	1 25 28.1	1.16	1.27
38 0	1 26 43.2	1 26 30.5	1 26 17.8	1 26 5.1	1 25 52.4	1 25 39.7	1.17	1.27
38 10	1 26 55.1	1 26 42.3	1 26 29.6	1 26 16.9	1 26 4.2	1 25 51.5	1.18	1.27
38 20	1 27 7.0	1 26 54.3	1 26 41.5	1 26 28.8	1 26 16.0	1 26 3.3	+1.19	-1.27
38 30	1 27 19.1	1 27 6.3	1 26 53.5	1 26 40.8	1 26 28.0	1 26 15.2	1.20	1.28
38 40	1 27 31.3	1 27 18.5	1 27 5.7	1 26 52.9	1 26 40.0	1 26 27.2	1.21	1.28
38 50	1 27 43.6	1 27 30.7	1 27 17.9	1 27 5.0	1 26 52.2	1 26 39.4	1.22	1.28
39 0	1 27 55.9	1 27 43.1	1 27 30.2	1 27 17.3	1 27 4.5	1 26 51.6	1.23	1.29
39 10	1 28 8.4	1 27 55.5	1 27 42.6	1 27 29.7	1 27 16.8	1 27 3.9	+1.24	-1.29
39 20	1 28 21.0	1 28 8.1	1 27 55.1	1 27 42.2	1 27 29.3	1 27 16.4	1.26	1.29
39 30	1 28 33.7	1 28 20.7	1 28 7.8	1 27 54.8	1 27 41.9	1 27 28.9	1.27	1.30
39 40	1 28 46.5	1 28 33.5	1 28 20.5	1 28 7.5	1 27 54.5	1 27 41.5	1.28	1.30
39 50	1 28 59.4	1 28 46.4	1 28 33.4	1 28 20.3	1 28 7.3	1 27 54.3	1.29	1.30
40 0	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.2	1 28 7.1	+1.30	-1.31

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Decl. Lat.							Variation for—	
	88° 51' 40"	88° 51' 50"	88° 52' 0"	88° 52' 10"	88° 52' 20"	88° 52' 30"	1' of Lat.	1" of s.
40 0	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.2	1 28 7.1	+1.30	-1.31
40 10	1 29 25.5	1 29 12.4	1 28 59.4	1 28 46.3	1 28 33.2	1 28 20.1	1.31	1.31
40 20	1 29 38.8	1 29 25.7	1 29 12.5	1 28 59.4	1 28 46.3	1 28 33.2	1.32	1.31
40 30	1 29 52.1	1 29 39.0	1 29 25.8	1 29 12.7	1 28 59.5	1 28 46.4	1.33	1.31
40 40	1 30 5.6	1 29 52.4	1 29 39.2	1 29 26.0	1 29 12.8	1 28 59.6	1.34	1.32
40 50	1 30 19.1	1 30 5.9	1 29 52.7	1 29 39.5	1 29 26.3	1 29 13.0	+1.35	-1.32
41 0	1 30 32.8	1 30 19.6	1 30 6.3	1 29 53.1	1 29 39.8	1 29 26.6	1.37	1.32
41 10	1 30 46.6	1 30 33.3	1 30 20.1	1 30 6.8	1 29 53.5	1 29 40.2	1.38	1.33
41 20	1 31 0.5	1 30 47.2	1 30 33.9	1 30 20.6	1 30 7.3	1 29 53.9	1.39	1.33
41 30	1 31 14.6	1 31 1.2	1 30 47.9	1 30 34.5	1 30 21.2	1 30 7.8	1.40	1.34
41 40	1 31 28.7	1 31 15.3	1 31 2.0	1 30 48.6	1 30 35.2	1 30 21.8	+1.41	-1.34
41 50	1 31 43.0	1 31 29.6	1 31 16.2	1 31 2.7	1 30 49.3	1 30 35.9	1.42	1.34
42 0	1 31 57.4	1 31 43.9	1 31 30.5	1 31 17.0	1 31 3.6	1 30 50.1	1.43	1.35
42 10	1 32 11.9	1 31 58.4	1 31 44.9	1 31 31.4	1 31 17.9	1 31 4.4	1.45	1.35
42 20	1 32 26.5	1 32 13.0	1 31 59.5	1 31 46.0	1 31 32.4	1 31 18.9	1.46	1.35
42 30	1 32 41.3	1 32 27.7	1 32 14.2	1 32 0.6	1 31 47.0	1 31 33.5	+1.47	-1.36
42 40	1 32 56.2	1 32 42.6	1 32 29.0	1 32 15.4	1 32 1.8	1 31 48.2	1.48	1.36
42 50	1 33 11.2	1 32 57.6	1 32 43.9	1 32 30.3	1 32 16.7	1 32 3.0	1.50	1.36
43 0	1 33 26.4	1 33 12.7	1 32 59.0	1 32 45.3	1 32 31.7	1 32 18.0	1.51	1.37
43 10	1 33 41.6	1 33 27.9	1 33 14.2	1 33 0.5	1 32 46.8	1 32 33.1	1.52	1.37
43 20	1 33 57.0	1 33 43.3	1 33 29.5	1 33 15.8	1 33 2.0	1 32 48.3	+1.54	-1.37
43 30	1 34 12.6	1 33 58.8	1 33 45.0	1 33 31.2	1 33 17.4	1 33 3.6	1.55	1.38
43 40	1 34 28.3	1 34 14.4	1 34 0.6	1 33 46.8	1 33 33.0	1 33 19.1	1.56	1.38
43 50	1 34 44.1	1 34 30.2	1 34 16.3	1 34 2.5	1 33 48.6	1 33 34.7	1.58	1.39
44 0	1 35 0.0	1 34 46.1	1 34 32.2	1 34 18.3	1 34 4.4	1 33 50.5	1.59	1.39
44 10	1 35 16.1	1 35 2.2	1 34 48.2	1 34 34.3	1 34 20.3	1 34 6.4	+1.61	-1.39
44 20	1 35 32.3	1 35 18.4	1 35 4.4	1 34 50.4	1 34 36.4	1 34 22.4	1.62	1.40
44 30	1 35 48.7	1 35 34.7	1 35 20.7	1 35 6.6	1 34 52.6	1 34 38.6	1.63	1.40
44 40	1 36 5.2	1 35 51.2	1 35 37.1	1 35 23.0	1 35 9.0	1 34 54.9	1.64	1.41
44 50	1 36 21.9	1 36 7.8	1 35 53.6	1 35 39.5	1 35 25.4	1 35 11.3	1.66	1.41
45 0	1 36 38.7	1 36 24.5	1 36 10.4	1 35 56.2	1 35 42.1	1 35 27.9	+1.68	-1.42
45 10	1 36 55.6	1 36 41.4	1 36 27.2	1 36 13.0	1 35 58.9	1 35 44.7	1.69	1.42
45 20	1 37 12.7	1 36 58.5	1 36 44.2	1 36 30.0	1 36 15.8	1 36 1.6	1.71	1.42
45 30	1 37 29.9	1 37 15.7	1 37 1.4	1 36 47.1	1 36 32.9	1 36 18.6	1.72	1.43
45 40	1 37 47.3	1 37 33.0	1 37 18.7	1 37 4.4	1 36 50.1	1 36 35.8	1.74	1.43
45 50	1 38 4.9	1 37 50.5	1 37 36.2	1 37 21.8	1 37 7.5	1 36 53.1	+1.75	-1.44
46 0	1 38 22.6	1 38 8.2	1 37 53.8	1 37 39.4	1 37 25.0	1 37 10.6	1.77	1.44
46 10	1 38 40.5	1 38 26.0	1 38 11.6	1 37 57.1	1 37 42.7	1 37 28.3	1.78	1.44
46 20	1 38 58.5	1 38 44.0	1 38 29.5	1 38 15.0	1 38 0.5	1 37 46.1	1.80	1.45
46 30	1 39 16.7	1 39 2.1	1 38 47.6	1 38 33.1	1 38 18.5	1 38 4.0	1.82	1.45
46 40	1 39 35.0	1 39 20.4	1 39 5.9	1 38 51.3	1 38 36.7	1 38 22.1	+1.83	-1.46
46 50	1 39 53.5	1 39 38.9	1 39 24.3	1 39 9.7	1 38 55.0	1 38 40.4	1.85	1.46
47 0	1 40 12.2	1 39 57.5	1 39 42.9	1 39 28.2	1 39 13.5	1 38 58.9	1.86	1.47
47 10	1 40 31.0	1 40 16.3	1 40 1.6	1 39 46.9	1 39 32.2	1 39 17.5	1.88	1.47
47 20	1 40 50.1	1 40 35.3	1 40 20.5	1 40 5.8	1 39 51.0	1 39 36.3	1.90	1.48
47 30	1 41 9.2	1 40 54.4	1 40 39.6	1 40 24.8	1 40 10.0	1 39 55.2	+1.92	-1.48
47 40	1 41 28.6	1 41 13.8	1 40 58.9	1 40 44.0	1 40 29.2	1 40 14.3	1.93	1.49
47 50	1 41 48.1	1 41 33.2	1 41 18.3	1 41 3.4	1 40 48.5	1 40 33.6	1.95	1.49
48 0	1 42 7.8	1 41 52.9	1 41 38.0	1 41 23.0	1 41 8.1	1 40 53.1	1.97	1.49
48 10	1 42 27.7	1 42 12.8	1 41 57.8	1 41 42.8	1 41 27.8	1 41 12.8	1.98	1.50
48 20	1 42 47.8	1 42 32.8	1 42 17.7	1 42 2.7	1 41 47.6	1 41 32.6	+2.00	-1.50
48 30	1 43 8.1	1 42 53.0	1 42 37.9	1 42 22.8	1 42 7.7	1 41 52.6	2.02	1.51
48 40	1 43 28.5	1 43 13.4	1 42 58.2	1 42 43.1	1 42 27.9	1 42 12.8	2.04	1.51
48 50	1 43 49.2	1 43 34.0	1 43 18.8	1 43 3.6	1 42 48.4	1 42 33.2	2.06	1.52
49 0	1 44 10.0	1 43 54.7	1 43 39.5	1 43 24.2	1 43 9.0	1 42 53.8	2.08	1.52
49 10	1 44 31.0	1 44 15.7	1 44 0.4	1 43 45.1	1 43 29.8	1 43 14.5	+2.10	-1.53
49 20	1 44 52.2	1 44 36.9	1 44 21.5	1 44 6.2	1 43 50.8	1 43 35.5	2.12	1.53
49 30	1 45 13.6	1 44 58.2	1 44 42.8	1 44 27.4	1 44 12.0	1 43 56.6	2.14	1.54
49 40	1 45 35.2	1 45 19.8	1 45 4.3	1 44 48.9	1 44 33.4	1 44 18.0	2.16	1.54
49 50	1 45 57.0	1 45 41.5	1 45 26.0	1 45 10.5	1 44 55.0	1 44 39.5	2.18	1.55
50 0	1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	1 45 16.8	1 45 1.3	+2.20	-1.56

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Decl. Lat.	88° 51' 40''	88° 51' 50''	88° 52' 0''	88° 52' 10''	88° 52' 20''	88° 52' 30''	Variation for—	
							1' of Lat.	1' of d.
50 0	1 46 19.1	1 46 3.5	1 45 47.9	1 45 32.4	1 45 16.8	1 45 1.3	+2.20	-1.56
50 10	1 46 41.3	1 46 25.7	1 46 10.1	1 45 54.4	1 45 38.8	1 45 23.2	2.22	1.56
50 20	1 47 3.7	1 46 48.1	1 46 32.4	1 46 16.7	1 46 1.1	1 45 45.4	2.24	1.57
50 30	1 47 26.4	1 47 10.6	1 46 54.9	1 46 39.2	1 46 23.5	1 46 7.7	2.26	1.57
50 40	1 47 49.2	1 47 33.5	1 47 17.7	1 47 1.9	1 46 46.1	1 46 30.3	2.28	1.58
50 50	1 48 12.3	1 47 56.5	1 47 40.6	1 47 24.8	1 47 9.0	1 46 53.1	+2.30	-1.58
51 0	1 48 35.6	1 48 19.7	1 48 3.8	1 47 47.9	1 47 32.0	1 47 16.1	2.33	1.59
51 10	1 48 59.1	1 48 43.2	1 48 27.2	1 48 11.3	1 47 55.3	1 47 39.4	2.35	1.59
51 20	1 49 22.9	1 49 6.9	1 48 50.9	1 48 34.9	1 48 18.9	1 48 2.9	2.37	1.60
51 30	1 49 46.9	1 49 30.8	1 49 14.7	1 48 58.7	1 48 42.6	1 48 26.5	2.39	1.61
51 40	1 50 11.1	1 49 55.0	1 49 38.8	1 49 22.7	1 49 6.6	1 48 50.4	+2.42	-1.61
51 50	1 50 35.5	1 50 19.4	1 50 3.2	1 49 47.0	1 49 30.8	1 49 14.6	2.44	1.62
52 0	1 51 0.2	1 50 44.0	1 50 27.7	1 50 11.5	1 49 55.2	1 49 39.0	2.46	1.62
52 10	1 51 25.1	1 51 8.8	1 50 52.5	1 50 36.2	1 50 19.9	1 50 3.6	2.49	1.63
52 20	1 51 50.3	1 51 34.0	1 51 17.6	1 51 1.2	1 50 44.8	1 50 28.5	2.51	1.64
52 30	1 52 15.7	1 51 59.3	1 51 42.9	1 51 26.4	1 51 10.0	1 50 53.6	+2.54	-1.64
52 40	1 52 41.4	1 52 24.9	1 52 8.4	1 51 51.9	1 51 35.4	1 51 19.9	2.56	1.65
52 50	1 53 7.3	1 52 50.8	1 52 34.2	1 52 17.7	1 52 1.1	1 51 44.5	2.59	1.66
53 0	1 53 33.5	1 53 16.9	1 53 0.3	1 52 43.6	1 52 27.0	1 52 10.4	2.61	1.66
53 10	1 54 0.0	1 53 43.3	1 53 26.6	1 53 9.9	1 52 53.2	1 52 36.5	2.64	1.67
53 20	1 54 26.7	1 54 9.9	1 53 53.2	1 53 36.4	1 53 19.7	1 53 2.9	+2.67	-1.68
53 30	1 54 53.6	1 54 36.8	1 54 20.0	1 54 3.2	1 53 46.4	1 53 29.6	2.69	1.68
53 40	1 55 20.9	1 55 4.0	1 54 47.1	1 54 30.2	1 54 13.4	1 53 56.5	2.72	1.69
53 50	1 55 48.4	1 55 31.5	1 55 14.5	1 54 57.6	1 54 40.6	1 54 23.7	2.75	1.69
54 0	1 56 16.2	1 55 59.2	1 55 42.2	1 55 25.1	1 55 8.1	1 54 51.1	2.78	1.70
54 10	1 56 44.3	1 56 27.2	1 56 10.1	1 55 53.0	1 55 35.9	1 55 18.8	+2.80	-1.71
54 20	1 57 12.7	1 56 55.5	1 56 38.3	1 56 21.2	1 56 4.0	1 55 46.9	2.83	1.72
54 30	1 57 41.3	1 57 24.1	1 57 6.9	1 56 49.6	1 56 32.4	1 56 15.2	2.86	1.72
54 40	1 58 10.3	1 57 53.0	1 57 35.7	1 57 18.4	1 57 1.1	1 56 43.8	2.89	1.73
54 50	1 58 39.5	1 58 22.2	1 58 4.8	1 57 47.4	1 57 30.1	1 57 12.7	2.92	1.74
55 0	1 59 9.1	1 58 51.6	1 58 34.2	1 58 16.8	1 57 59.3	1 57 41.9	+2.95	-1.74
55 10	1 59 39.0	1 59 21.4	1 59 3.9	1 58 46.4	1 58 28.9	1 58 11.4	2.98	1.75
55 20	2 0 9.1	1 59 51.6	1 59 34.0	1 59 16.4	1 58 58.8	1 58 41.2	3.01	1.76
55 30	2 0 39.6	2 0 22.0	2 0 4.3	1 59 46.6	1 59 29.0	1 59 11.4	3.04	1.76
55 40	2 1 10.4	2 0 52.7	2 0 35.0	2 0 17.2	1 59 59.5	1 59 41.8	3.08	1.77
55 50	2 1 41.6	2 1 23.8	2 1 6.0	2 0 48.1	2 0 30.3	2 0 12.5	+3.11	-1.78
56 0	2 2 13.1	2 1 55.2	2 1 37.3	2 1 19.4	2 1 1.5	2 0 43.6	3.14	1.79
56 10	2 2 44.9	2 2 26.9	2 2 8.9	2 1 51.0	2 1 33.0	2 1 15.0	3.18	1.80
56 20	2 3 17.0	2 2 59.0	2 2 40.9	2 2 22.9	2 2 4.8	2 1 46.8	3.21	1.80
56 30	2 3 49.5	2 3 31.4	2 3 13.2	2 2 55.1	2 2 37.0	2 2 18.9	3.24	1.81
56 40	2 4 22.3	2 4 4.1	2 3 45.9	2 3 27.7	2 3 9.5	2 2 51.3	+3.28	-1.82
56 50	2 4 55.5	2 4 37.2	2 4 19.0	2 4 0.7	2 3 42.4	2 3 24.1	3.32	1.83
57 0	2 5 29.1	2 5 10.7	2 4 52.4	2 4 34.0	2 4 15.6	2 3 57.2	3.35	1.84
57 10	2 6 3.0	2 5 44.6	2 5 26.1	2 5 7.7	2 4 49.2	2 4 30.8	3.38	1.84
57 20	2 6 37.3	2 6 18.8	2 6 0.2	2 5 41.7	2 5 23.2	2 5 4.6	3.42	1.85
57 30	2 7 12.0	2 6 53.4	2 6 34.7	2 6 16.1	2 5 57.5	2 5 38.9	+3.46	-1.86
57 40	2 7 47.0	2 7 28.3	2 7 9.6	2 6 50.9	2 6 32.2	2 6 13.5	3.50	1.87
57 50	2 8 22.5	2 8 3.7	2 7 44.9	2 7 26.1	2 7 7.3	2 6 48.5	3.54	1.88
58 0	2 8 58.3	2 8 39.4	2 8 20.6	2 8 1.7	2 7 42.8	2 7 23.9	3.58	1.89
58 10	2 9 34.6	2 9 15.6	2 8 56.6	2 8 37.7	2 8 18.7	2 7 59.7	3.62	1.90
58 20	2 10 11.2	2 9 52.2	2 9 33.1	2 9 14.0	2 8 55.0	2 8 35.9	+3.66	-1.91
58 30	2 10 48.3	2 10 29.1	2 10 10.0	2 9 50.8	2 9 31.7	2 9 12.6	3.71	1.91
58 40	2 11 25.8	2 11 6.5	2 10 47.3	2 10 28.1	2 10 8.8	2 9 49.6	3.75	1.92
58 50	2 12 3.7	2 11 44.4	2 11 25.0	2 11 5.7	2 10 46.4	2 10 27.0	3.79	1.93
59 0	2 12 42.0	2 12 22.6	2 12 3.2	2 11 43.8	2 11 24.3	2 11 4.9	3.84	1.94
59 10	2 13 20.8	2 13 1.3	2 12 41.8	2 12 22.3	2 12 2.7	2 11 43.2	+3.88	-1.95
59 20	2 14 0.0	2 13 40.4	2 13 20.8	2 13 1.2	2 12 41.6	2 12 22.0	3.92	1.96
59 30	2 14 39.7	2 14 20.0	2 14 0.3	2 13 40.6	2 13 20.9	2 13 1.2	3.97	1.97
59 40	2 15 19.9	2 15 0.1	2 14 40.3	2 14 20.5	2 14 0.6	2 13 40.8	4.02	1.98
59 50	2 16 0.5	2 15 40.6	2 15 20.7	2 15 0.8	2 14 40.9	2 14 21.0	4.06	1.99
60 0	2 16 41.6	2 16 21.6	2 16 1.6	2 15 41.6	2 15 21.6	2 15 1.6	+4.11	-2.00

AZIMUTH OF POLARIS AT ELONGATION, 1917.

Decl. Lat.	88° 51' 40''		88° 51' 50''		88° 52' 0''		88° 52' 10''		88° 52' 20''		88° 52' 30''		Variation for—	
													1' of Lat.	1" of δ .
60 0	2	16 41.6	2	16 21.6	2	16 1.6	2	15 41.6	2	15 21.6	2	15 1.6	+4.11	-2.00
60 10	2	17 23.2	2	17 3.1	2	16 43.0	2	16 22.9	2	16 2.8	2	15 42.6	4.16	2.01
60 20	2	18 5.3	2	17 45.1	2	17 24.9	2	17 4.6	2	16 44.4	2	16 24.2	4.21	2.02
60 30	2	18 47.9	2	18 27.6	2	18 7.2	2	17 46.9	2	17 26.6	2	17 6.3	4.26	2.03
60 40	2	19 31.0	2	19 10.6	2	18 50.1	2	18 29.7	2	18 9.3	2	17 48.8	4.31	2.04
60 50	2	20 14.6	2	19 54.1	2	19 33.5	2	19 13.0	2	18 52.5	2	18 31.9	+4.36	-2.05
61 0	2	20 58.7	2	20 38.1	2	20 17.5	2	19 56.8	2	19 36.2	2	19 15.5	4.42	2.06
61 10	2	21 43.4	2	21 22.7	2	21 1.9	2	20 41.2	2	20 20.4	2	19 59.7	4.47	2.07
61 20	2	22 28.6	2	22 7.8	2	21 46.9	2	21 26.1	2	21 5.2	2	20 44.4	4.52	2.08
61 30	2	23 14.4	2	22 53.5	2	22 32.5	2	22 11.5	2	21 50.6	2	21 29.6	4.58	2.10
61 40	2	24 0.8	2	23 39.7	2	23 18.6	2	22 57.5	2	22 36.5	2	22 15.4	+4.64	-2.11
61 50	2	24 47.7	2	24 26.5	2	24 5.3	2	23 44.1	2	23 23.0	2	23 1.8	4.70	2.12
62 0	2	25 35.3	2	25 13.9	2	24 52.6	2	24 31.3	2	24 10.0	2	23 48.7	4.76	2.13
62 10	2	26 23.4	2	26 1.9	2	25 40.5	2	25 19.1	2	24 57.6	2	24 36.2	4.81	2.14
62 20	2	27 12.1	2	26 50.6	2	26 29.0	2	26 7.4	2	25 45.9	2	25 24.3	4.87	2.16
62 30	2	28 1.4	2	27 39.8	2	27 18.1	2	26 56.4	2	26 34.8	2	26 13.1	+4.94	-2.17
62 40	2	28 51.4	2	28 29.6	2	28 7.8	2	27 46.0	2	27 24.3	2	27 2.5	5.00	2.18
62 50	2	29 42.0	2	29 20.1	2	28 58.2	2	28 36.3	2	28 14.4	2	27 52.5	5.06	2.19
63 0	2	30 33.3	2	30 11.3	2	29 49.2	2	29 27.2	2	29 5.1	2	28 43.1	5.13	2.20
63 10	2	31 25.3	2	31 3.1	2	30 40.9	2	30 18.8	2	29 56.6	2	29 34.4	5.20	2.22
63 20	2	32 17.9	2	31 55.6	2	31 33.3	2	31 11.0	2	30 48.7	2	30 26.4	+5.26	-2.23
63 30	2	33 11.2	2	32 48.8	2	32 26.3	2	32 3.9	2	31 41.5	2	31 19.0	5.33	2.24
63 40	2	34 5.2	2	33 42.6	2	33 20.1	2	32 57.5	2	32 35.0	2	32 12.4	5.40	2.26
63 50	2	34 59.9	2	34 37.2	2	34 14.5	2	33 51.8	2	33 29.2	2	33 6.5	5.48	2.27
64 0	2	35 55.4	2	35 32.6	2	35 9.7	2	34 46.9	2	34 24.1	2	34 1.2	5.55	2.28
64 10	2	36 51.6	2	36 28.6	2	36 5.7	2	35 42.7	2	35 19.7	2	34 56.8	+5.63	-2.30
64 20	2	37 48.6	2	37 25.5	2	37 2.4	2	36 39.3	2	36 16.1	2	35 53.0	5.70	2.31
64 30	2	38 46.3	2	38 23.1	2	37 59.8	2	37 36.6	2	37 13.3	2	36 50.1	5.78	2.32
64 40	2	39 44.9	2	39 21.5	2	38 58.1	2	38 34.7	2	38 11.3	2	37 47.9	5.86	2.34
64 50	2	40 44.2	2	40 20.7	2	39 57.1	2	39 33.6	2	39 10.1	2	38 46.5	5.94	2.35
65 0	2	41 44.4	2	41 20.7	2	40 57.0	2	40 33.3	2	40 9.6	2	39 45.9	+6.02	-2.37
65 10	2	42 45.4	2	42 21.5	2	41 57.7	2	41 33.9	2	41 10.0	2	40 46.2	6.10	2.38
65 20	2	43 47.2	2	43 23.2	2	42 59.3	2	42 35.3	2	42 11.3	2	41 47.3	6.19	2.40
65 30	2	44 50.0	2	44 25.8	2	44 1.7	2	43 37.6	2	43 13.4	2	42 49.3	6.28	2.41
65 40	2	45 53.6	2	45 29.3	2	45 5.0	2	44 40.7	2	44 16.4	2	43 52.1	6.37	2.43
65 50	2	46 58.1	2	46 33.7	2	46 9.2	2	45 44.8	2	45 20.3	2	44 55.9	+6.46	-2.44
66 0	2	48 3.6	2	47 39.0	2	47 14.4	2	46 49.8	2	46 25.1	2	46 0.5	6.56	2.46
66 10	2	49 10.0	2	48 45.2	2	48 20.5	2	47 55.7	2	47 30.9	2	47 6.1	6.65	2.48
66 20	2	50 17.4	2	49 52.4	2	49 27.5	2	49 2.6	2	48 37.6	2	48 12.7	6.75	2.49
66 30	2	51 25.7	2	51 0.6	2	50 35.5	2	50 10.4	2	49 45.3	2	49 20.2	6.85	2.51
66 40	2	52 35.1	2	52 9.8	2	51 44.6	2	51 19.3	2	50 54.0	2	50 28.7	+6.95	-2.53
66 50	2	53 45.5	2	53 20.1	2	52 54.6	2	52 29.2	2	52 3.7	2	51 38.3	7.05	2.54
67 0	2	54 57.0	2	54 31.4	2	54 5.7	2	53 40.1	2	53 14.5	2	52 48.9	7.16	2.56
67 10	2	56 9.5	2	55 43.7	2	55 17.9	2	54 52.1	2	54 26.3	2	54 0.5	7.27	2.58
67 20	2	57 23.2	2	56 57.2	2	56 31.2	2	56 5.2	2	55 39.3	2	55 13.3	7.38	2.60
67 30	2	58 37.9	2	58 11.8	2	57 45.6	2	57 19.4	2	56 53.3	2	56 27.1	+7.49	-2.62
67 40	2	59 53.8	2	59 27.5	2	59 1.2	2	58 34.8	2	58 8.5	2	57 42.1	7.60	2.63
67 50	3	1 10.9	3	0 44.4	3	0 17.9	2	59 51.3	2	59 24.8	2	58 58.3	7.72	2.65
68 0	3	2 29.2	3	2 2.5	3	1 35.8	3	1 9.0	3	0 42.3	3	0 15.6	7.84	2.67
68 10	3	3 48.8	3	3 21.8	3	2 54.9	3	2 28.0	3	2 1.1	3	1 34.2	7.97	2.69
68 20	3	5 9.6	3	4 42.4	3	4 15.3	3	3 48.2	3	3 21.1	3	2 54.0	+8.10	-2.71
68 30	3	6 31.6	3	6 4.3	3	5 37.0	3	5 9.7	3	4 42.3	3	4 15.0	8.23	2.73
68 40	3	7 55.0	3	7 27.5	3	7 0.0	3	6 32.4	3	6 4.9	3	5 37.4	8.36	2.75
68 50	3	9 19.8	3	8 52.0	3	8 24.3	3	7 56.6	3	7 28.8	3	7 1.1	8.49	2.77
69 0	3	10 45.9	3	10 17.9	3	9 50.0	3	9 22.1	3	8 54.1	3	8 26.2	8.63	2.79
69 10	3	12 13.4	3	11 45.3	3	11 17.1	3	10 49.0	3	10 20.8	3	9 52.6	+8.77	-2.82
69 20	3	13 42.4	3	13 14.0	3	12 45.7	3	12 17.3	3	11 48.9	3	11 20.5	8.92	2.84
69 30	3	15 12.9	3	14 44.3	3	14 15.7	3	13 47.1	3	13 18.5	3	12 49.9	9.06	2.86
69 40	3	16 44.9	3	16 16.0	3	15 47.2	3	15 18.4	3	14 49.6	3	14 20.8	9.22	2.88
69 50	3	18 18.4	3	17 49.4	3	17 20.3	3	16 51.3	3	16 22.2	3	15 53.2	9.38	2.90
70 0	3	19 53.6	3	19 24.3	3	18 55.0	3	18 25.7	3	17 56.4	3	17 27.2	+9.54	-2.98

FOR REDUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

Time.*	1° 0'	1° 10'	1° 20'	1° 30'	1° 40'	1° 50'	2° 0'	2° 10'	Time.*
Time.*	1° 0'	1° 10'	1° 20'	1° 30'	1° 40'	1° 50'	2° 0'	2° 10'	Time.*
m	"	"	"	"	"	"	"	"	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
5	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
6	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
7	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
9	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
10	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
11	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
12	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
13	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
14	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
15	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
16	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
17	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
18	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
19	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
20	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
21	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
22	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
23	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
24	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
25	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

Time.*	2° 10'	2° 20'	2° 30'	2° 40'	2° 50'	3° 0'	3° 10'	3° 20'	Time.*
Time.*	2° 10'	2° 20'	2° 30'	2° 40'	2° 50'	3° 0'	3° 10'	3° 20'	Time.*
m	"	"	"	"	"	"	"	"	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
3	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
4	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
5	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
7	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
8	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
9	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
10	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
11	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
12	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
13	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
14	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
15	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
16	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
17	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
18	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
19	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
20	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
21	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
22	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
23	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
24	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
25	+46.4	+49.9	+53.5	+57.1	+60.7	+64.2	+67.8	+71.4	25

*Sidereal time from elongation.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS, 1917, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1917, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between either of the observed times above mentioned and upper or lower culmination, as the case may be, is given for ζ Ursæ Majoris and δ Cassiopeiæ at ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

ζ URSÆ MAJORIS (MIZAR). (Upper culmination of Polaris.)						δ CASSIOPEIÆ. (Lower culmination of Polaris.)							
Date.	Lat.	40°	45°	50°	55°	60°	Date.	Lat.	35°	40°	45°	50°	55°
		m s	m s	m s	m s	m s			m s	m s	m s	m s	m s
Jan.	1	9 26	9 24	9 22	9 19	9 16	Jan.	1	10 33	10 35	10 36	10 39	10 42
	11	9 16	9 14	9 12	9 9	9 6		11	10 22	10 24	10 26	10 28	10 31
	21	9 5	9 3	9 1	8 59	8 55		21	10 12	10 14	10 15	10 18	10 20
	31	8 54	8 53	8 51	8 48	8 45		31	10 1	10 3	10 4	10 7	10 10
Feb.	10	8 44	8 43	8 41	8 38	8 35	Feb.	10	9 51	9 52	9 54	9 57	9 59
	20	8 35	8 34	8 32	8 29	8 26		20	9 42	9 43	9 45	9 47	9 50
Mar.	2	8 28	8 26	8 24	8 22	8 18	Mar.	2	9 34	9 35	9 37	9 39	9 42
	12							12	9 28	9 29	9 31	9 33	9 36
June	30	9 11	9 10	9 8	9 5	9 2		22	9 23	9 25	9 27	9 29	9 31
July	10	9 23	9 21	9 19	9 16	9 12	Apr.	1	9 21	9 22	9 24	9 26	9 29
	20	9 34	9 32	9 30	9 27	9 23		11	9 20	9 22	9 23	9 26	9 28
	30	9 44	9 43	9 40	9 38	9 34		21	9 22	9 24	9 25	9 28	9 30
Aug.	9	9 55	9 53	9 51	9 48	9 44	May	1	9 26	9 28	9 29	9 31	9 34
	19	10 5	10 3	10 1	9 58	9 54		11	9 32	9 33	9 34	9 37	9 40
	29	10 14	10 12	10 9	10 7	10 3		21	9 39	9 40	9 42	9 44	9 47
Sept.	8	10 22	10 20	10 17	10 14	10 10		31	9 47	9 49	9 50	9 53	9 56
	18	10 28	10 26	10 24	10 21	10 17	June	10	9 57	9 59	10 0	10 3	10 6
	28	10 33	10 31	10 29	10 26	10 22		20	10 8	10 9	10 11	10 13	10 16
Oct.	8	10 37	10 35	10 33	10 29	10 26		30	10 19	10 20	10 22	10 24	10 27
	18	10 39	10 37	10 35	10 31	10 28	July	10	10 30	10 32	10 33	10 36	10 39
	28	10 39	10 38	10 35	10 32	10 28		20	10 41	10 43	10 44	10 47	10 50
Nov.	7	10 38	10 36	10 34	10 31	10 27	July	30	10 52	10 54	10 56	10 59	11 2
	17	10 35	10 33	10 31	10 28	10 24							
	27	10 30	10 28	10 26	10 23	10 19	Nov.	27	11 39	11 41	11 43	11 46	11 49
Dec.	7	10 24	10 22	10 19	10 16	10 13	Dec.	7	11 32	11 34	11 36	11 39	11 42
	17	10 16	10 14	10 12	10 8	10 5		17	11 24	11 26	11 28	11 31	11 34
	27	10 7	10 5	10 3	10 0	9 56		27	11 15	11 17	11 18	11 21	11 24
	31	10 3	10 1	9 59	9 56	9 52		31	11 11	11 13	11 14	11 17	11 20

APPARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1917.

The local mean time of culmination on any meridian for a given date is found by taking from the following table the *Mean Time* of the nearest Greenwich culmination, and applying to it the product of the *Var. per Day* by the integral number of intervening days, this product being numerically additive for an earlier date and subtractive for a later date than that given in the table; and by applying also the product of the *Var. per Hour* by the longitude from Greenwich expressed in hours and fractions of an hour, this product being numerically additive for East longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12^h diminished by one-half the numerical value of the *Var. per Day*.

The last column below applies to all meridians.

Date.	Upper Culmination, Meridian of Greenwich.					Latitude.	Mean Time Interval, Elongation minus Upper Culm.
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.		
	h m l 29 s	° ' " +88 51 "	h m s	m s	W. E. s	°	W. h m E.
Jan. 1	89	70.6	6 47 7	-3 56.9	-9.87+	10	+5 58.2-
11	79	71.6	6 7 37	3 57.0	9.88	12	5 58.1
21	68	71.9	5 28 8	3 57.0	9.88	14	5 57.9
31	58	71.5	4 48 38	3 56.9	9.87	16	5 57.7
Feb. 10	48	70.5	4 9 9	3 56.9	9.87	18	5 57.6
20	39	69.0	3 29 41	-3 56.8	-9.87+	20	+5 57.4-
Mar. 2	31	66.9	2 50 14	3 56.6	9.86	22	5 57.2
12	25	64.3	2 10 49	3 56.5	9.85	24	5 57.0
22	20	61.5	1 31 25	3 56.3	9.84	26	5 56.8
Apr. 1	18	58.5	0 52 4	3 56.0	9.83	28	5 56.6
11	17	55.3	0 12 44	-3 55.8	-9.82+	30	+5 56.4-
20	19	52.2	23 33 27	3 55.6	9.82	32	5 56.2
30	23	49.3	22 54 11	3 55.4	9.81	34	5 56.0
May 10	28	46.7	22 14 58	3 55.3	9.80	36	5 55.7
20	35	44.4	21 35 46	3 55.1	9.80	38	5 55.5
30	44	42.5	20 56 35	-3 55.0	-9.79+	40	+5 55.2-
June 9	54	41.1	20 17 26	3 54.9	9.79	42	5 54.9
19	64	40.2	19 38 17	3 54.8	9.78	44	5 54.7
29	75	39.8	18 59 9	3 54.8	9.78	46	5 54.3
July 9	87	40.0	18 20 1	3 54.8	9.78	48	5 54.0
19	98	40.7	17 40 54	-3 54.8	-9.78+	50	+5 53.6-
29	109	42.0	17 1 46	3 54.8	9.78	52	5 53.2
Aug. 8	120	43.7	16 22 37	3 54.9	9.79	54	5 52.8
18	130	45.9	15 43 28	3 54.9	9.79	56	5 52.3
28	139	48.6	15 4 18	3 55.0	9.79	58	5 51.8
Sept. 7	147	51.6	14 25 7	-3 55.2	-9.80+	60	+5 51.2-
17	154	54.8	13 45 55	3 55.3	9.80	62	5 50.5
27	160	58.4	13 6 41	3 55.4	9.81	64	5 49.8
Oct. 7	164	62.0	12 27 26	3 55.6	9.82	66	5 48.9
17	166	65.8	11 48 9	3 55.8	9.82	68	5 47.8
27	167	69.6	11 8 51	-3 55.9	-9.83+	70	+5 46.6-
Nov. 6	165	73.3	10 29 31	3 56.1	9.84		
16	162	76.8	9 50 9	3 56.3	9.85		
26	158	80.1	9 10 45	3 56.4	9.85		
Dec. 6	152	83.0	8 31 20	3 56.6	9.86		
16	144	85.5	7 51 53	-3 56.8	-9.87+		
26	135	87.5	7 12 25	-3 56.9	-9.87+		

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of fixed stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for Greenwich mean noon on pages 2-16 and for Washington apparent noon on pages 514-521.

The Mean Solar Day is the unit of mean solar time and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two suc-

cessive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m 56^s.555$ sidereal time or $3^m 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing 366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h , astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h , astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2-17 contain for Greenwich mean noon of each day the *Sun's Apparent Right Ascension, Apparent Declination, Semidiameter, Horizontal Parallax, True Longitude, and Latitude*. They also contain the *Logarithm of the Radius Vector of the Earth, the Precession in Longitude, the Nutation in Longitude, the Aberration, the True Obliquity, the Equation of Time, the Sidereal Time or Right Ascension of Mean Sun, and the Mean Time of Sidereal Noon*. Adjoining columns contain, for each Greenwich mean noon, the *Variation per*

Hour for those of the quantities for which it seemed advisable to give a rate of motion. By multiplying any one of those variations by the hours and parts of an hour from Greenwich mean noon and adding the product algebraically to the corresponding quantity at noon, we obtain an approximate value of the quantity in question for any given Greenwich mean time. If great exactness is desired, the value of the hourly variation is found for the time halfway between Greenwich mean noon and the given Greenwich mean time before multiplying by the hours and parts of an hour from Greenwich mean noon.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations or latitudes indicates north and the negative sign south.

The Sun's *Apparent Right Ascension* and *Declination* are affected both by aberration and by nutation, and therefore denote the *apparent* position of the *true* Sun. The Sun's *True Longitude* is the true geometric longitude not corrected for aberration; it is referred to the true equinox.

The Sun's *Latitude* is referred to the ecliptic of the date.

The Sun's *Declination* is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude of the Sun referred to the mean equinox of the beginning of the Besselian fictitious year, i. e., the instant when the Sun's mean longitude is 280° , in order to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude of a body referred to the mean equinox of date in order to refer it to the true equinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude of the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, short-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, to take account of the short-period terms, may be found on pages 215–216.

The *Equation of Time* is the apparent time of Greenwich mean noon, or the hour angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude or to any Greenwich mean time by using the hourly variation, $+9^s.8565$; or by Table III, page 693 of this volume, for reducing intervals of mean time to sidereal time. It is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time.

and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time past noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 690 of this volume. If the sidereal interval is less than $3^m 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean time interval between these two mean times being $23^h 56^m 4^s.09$. The mean time, approximately known, will always show which one is to be taken. Instead of using Table II, the reduction of a sidereal to a mean time interval may be found by multiplying $-9^s.8296$ by the hours and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich; it may be reduced to any other meridian by using the hourly variation, $-9^s.8296$, to effect the necessary interpolation, or the reduction may be taken directly from Table II. In the same way the reduction may be made to any Greenwich sidereal time, and the result will then represent $24^h -$ Right Ascension of the Mean Sun. This column may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

As examples of the use of pages 2-17:

1. Let the Sun's declination be required for 1917, April 14, $2^h 5^m 20^s$, P. M., at a place whose longitude is $58^\circ 20'$, or $3^h 53^m 20^s$ west from Greenwich:

		h	m	s
Local mean time	April 14,	2	5	20
Longitude from Greenwich (additive)		3	53	20
Greenwich mean time	April 14,	5	58	40

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich mean noon on April 14, or $18^h.022$ before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declination per hour is:

At Greenwich mean noon, April 14	+54.12
At Greenwich mean noon, April 15	+53.73
Difference for one day	- 0.39

If great exactness is desired, we find the amount of this hourly variation for the time halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 hours. Three hours is 0.125 of a day; so the calculation is as follows:

Variation at Greenwich mean noon, April 14	. . .	+54.12
Change in 0.125 of a day.	. . . -0''.39×0.125	- 0.05
Variation at 3 hours after noon	. . . . .	+54.07
Declination at Greenwich noon, April 14	. . .	+9 18 2.1
Change in 5.978 hours	. . . +54''.07×5.978	+ 5 23.2
Sun's declination at time of observation	. . .	+9 23 25.3

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is 18^h.022 before Greenwich noon of April 15; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is +53''.88. Then we find:

Declination at Greenwich noon, April 15	. . .	+9 39 36.3
Change in -18.022 hours,	. . . +59''.88×-18.022	- 16 11.0
Sun's declination at time of observation	. . .	+9 23 25.3

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly the one derived from the nearest noon should be regarded as the more accurate.

2. Let the Sun's right ascension and the equation of time be required for 1917, July 13, 10^h 3^m 30^s, A. M., mean time, at a place whose longitude is 85° 15', or 5^h 41^m west from Greenwich.

Local astronomical mean time	. . . . .	July 12,	22 3 30
Longitude from Greenwich (additive)	. . . . .		5 41 0
Greenwich mean time	. . . . .	July 13,	3 44 30=3.7417
<i>Sun's Right Ascension.</i>		<i>Equation of Time.</i>	
Greenwich noon, July 13	. . . . .	7 23 38.63	-5 27.74
Change in 3.7417 hours	10°.162×3.7417	+ 38.02	- 1.14
		7 29 16.65	-5 28.88

In this case the hourly variations interpolated to half the interval, or 1^h.87 after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

Sidereal time at Greenwich mean noon, July 13	. . . . .	7 23 10.89
Reduction for 3 ^h 44 ^m 30 ^s from Table III, or 9°.8565×3.7417	. . .	+ 36.88
Add the local astronomical mean time	. . . . .	22 3 30.00
The required sidereal time (rejecting 24 ^h)	. . . . .	5 27 17.77

4. On 1917, July 13, A. M., at a place whose longitude is 85° 15' W., suppose the sidereal time to be 5^h 27^m 17^s.77 and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h 41^m 0^s$, or $+5^h.6833$.

First solution.

Sidereal time at Greenwich mean noon, July 12	$h \quad m \quad s$ 7 19 14.94
Reduction for $5^h 41^m 0^s$ from Table III, or $9^s.8565 \times 5.6833$	+56.02
The sidereal time at local mean noon, July 12	7 20 10.36
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29 27 17.77
Subtracting the first from the second gives the sidereal interval from noon	22 7 7.41 = $22^h.1187$
Reduction for $22^h 7^m 7^s.41$ from Table II, or $-9^s.8296 \times 22.1187$	-3 37.42
The required astronomical mean time July 12,	22 3 29.99

Second solution.

Mean time at Greenwich sidereal noon July 12,	$h \quad m \quad s$ 16 38 1.71
Reduction for longitude from Table II, or $-9^s.8296 \times 5.6833$	-55.86
Mean time of <i>preceding</i> local sidereal noon July 12,	16 37 5.85
Add the given sidereal time	5 27 17.77
Reduction for $5^h 27^m 17^s.77$ from Table II, or $-9^s.8296 \times 5.4549$	-53.62
The required astronomical mean time July 12,	22 3 30.00

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

Pages 18-25 contain the rectangular coordinates of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox as the plane and point of reference. Each coordinate is given for every Greenwich mean noon and midnight. The columns *Reduc. to Mean Eq'x of 1917.0* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and equinox of the beginning of the Besselian fictitious year.

Pages 26-117 contain *The Moon's Right Ascension and Declination* for each day and hour of Greenwich mean time, referred to the true equator and equinox. They are accompanied by columns of *Variations per Minute*, by means of which, interpolation may be conveniently made to any moment of Greenwich mean time. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Var. per Min.* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added numerically in case of the right ascension and algebraically in case of the declination.

Thus, suppose the Moon's right ascension and declination are required for 1917, January 25, $10^h 10^m 30^s$, astronomical mean time at Greenwich:

	<i>Right Ascension.</i>	<i>Declination.</i>
	$h \quad m \quad s$	$^{\circ} \quad ' \quad ''$
January 25, 10^h	22 47 20.84	-3 11 30.1
Change in 10.5 minutes $2^s.2307 \times 10.5$	23.42	+ 2 47.4
January 25, $10^h 10^m 30^s$	22 47 44.26	-3 8 42.7

For the sake of precision the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page 117 contains also the *Phases of the Moon* and the dates of the *Moon's Apogee* and *Perigee*, or greatest and least distances from the Earth.

Pages 118–133 contain for every Greenwich mean noon and midnight the *Moon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, its *Semidiameter*, and its *Equatorial Horizontal Parallax*. The column adjoining that of the horizontal parallax gives the variation of that quantity per hour, by means of which it can be reduced to any other Greenwich mean time in the manner shown in the preceding examples. When allowing for change in the variation itself, note must be taken of the fact that the tabular interval is here 12 hours instead of 24. The quantity thus obtained is the equatorial horizontal parallax; to obtain the horizontal parallax at any given place, the correction for the latitude of the place must be applied. The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see page xiii), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1917, March 10, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is 3''.3; then,

$$12^h : 7^h = 3''.3 : 1''.9$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The Moon's semidiameter for March 10, 7^h, is therefore 15' 4''.2.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since the preceding new Moon, given to tenths of a day; the mean time of the *Moon's Transit*, *Upper* and *Lower*, at Greenwich, given to tenths of a minute; and the *Variation per Hour* of the latter quantity, that is, the variation for one hour of longitude, by means of which the local time of an upper or lower transit of the Moon may be computed for any place whose longitude is known.

Pages 134–198 contain for each of the seven major planets the geocentric ephemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *Apparent Declination* with the respective *Variations per Hour* or *per Day*. The positions thus given are referred to the true equator and equinox, and are corrected for aberration. The geocentric ephemeris gives also the *Logarithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *Semidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time of *Transit Meridian of Greenwich*. All the data, except the last named, are given for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that already given for the Sun. The local mean time of meridian transit of any planet at any place can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric Longitude*, *Mean Equinox of Date*; the *Heliocentric Latitude*; and the *Logarithm of Radius Vector*; with

their respective *Variations per Day*. The heliocentric longitude may be referred to the true equinox by applying nutation. The variations are given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude measured along the orbit of the planet. This orbit longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is referred to the ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 200–201 contain formulæ for reducing mean positions of stars to apparent positions, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at any of the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A*, *C*, and *D* are sometimes needed to five places of decimals. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of α Aquilæ, July 2, 1917, for the upper transit at Washington.

log α	0.5165	log b	7.2446 n	log c	8.0440	log d	8.8235 n
log A	9.9280	log B	0.0768 n	log C	0.5420	log D	1.3035 n
log α'	0.5166	log b'	9.9941	log c'	9.4341	log d'	8.4152 n
log Aa	0.4425	log Bb	7.3212	log Cc	8.5860	log Dd	0.1270
log Aa'	0.4426	log Bb'	0.0707 n	log Cc'	9.9761	log Dd'	9.7187
<i>Mean Place, 1917.0</i>				$\alpha_0 =$	$18^{\text{h}} 37^{\text{m}} 43.817^{\text{s}}$	$\delta_0 =$	$-9^{\circ} 7' 58.66''$
				$Aa =$	+2.770	$Aa' =$	+2.77
				$Bb =$	+0.002	$Bb' =$	-1.18
				$Cc =$	+0.039	$Cc' =$	+0.95
				$Dd =$	+1.340	$Dd' =$	+0.52
				$E =$	+0.003	$\tau u' =$	0.00
				$\tau \mu =$	+0.001		
<i>Apparent Place, July 2,</i>				$\alpha =$	$18^{\text{h}} 37^{\text{m}} 47.972^{\text{s}}$	$\delta =$	$-9^{\circ} 7' 55.60''$

Pages 206–213 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 200, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use

the Besselian numbers, it is necessary to have the values of the star-constants, $a, b, c, d, a', b', c', d'$, while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of α Aquilæ, July 2, 1917, for the upper transit at Washington.

$G=23$	43.9	$\delta_0 = -9$	8.0
$\alpha_0 = 18$	37.7	$G + \alpha_0 = 18^h$	$21^m.6$
$H = 11$	20.7	$H + \alpha_0 = 5$	58.4
$\log \frac{1}{r}$	8.8239	$\log \frac{1}{r}$	8.8239
$\log g$	1.2291	$\log h$	1.3099
$\sin (G + \alpha_0)$	$9.9981 \text{ } n$	$\sin (H + \alpha_0)$	0.0000
$\tan \delta_0$	$9.2062 \text{ } n$	$\sec \delta_0$	0.0055
$\log (g)$	9.2573	$\log (h)$	0.1393
$\log g$	1.2291	$\log h$	1.3099
$\cos (G + \alpha_0)$	8.9736	$\cos (H + \alpha_0)$	7.8439
$\log (g')$	0.2027	$\sin \delta_0$	$9.2007 \text{ } n$
		$\log (h')$	$8.3545 \text{ } n$
$\log i$	0.1793		
$\cos \delta_0$	9.9945		
$\log (i)$	0.1738		
		$\alpha_0 =$	$18^h 37^m 43.817^s$
		$f + f' =$	$+2.594$
		$(g) =$	$+0.181$
		$(h) =$	$+1.378$
		$\tau \mu =$	$+0.001$
		$\alpha =$	$18^h 37^m 47.971^s$
		$\delta_0 = -9$	$7^m 58.66^s$
		$(g') =$	$+1.59$
		$(h') =$	-0.02
		$(i) =$	$+1.49$
		$\tau \mu' =$	0.00
		$\delta = -9$	$7^m 55.60^s$

Page 214 contains for every tenth sidereal day the *Besselian and Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 316–513, for which data containing short-period terms should not be employed.

Pages 215–216 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 201, and the coefficients mentioned later, which are given for each star on pages 316–513.

Pages 217–230 contain the *Mean Places of Ten-day Stars* for the beginning of the Besselian fictitious year. These pages give also the magnitude, spectral type, annual variations, and proper motions for each star. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars*, the same data as the immediately preceding pages do for the ten-day stars.

Pages 232–315 contain for every upper transit at Washington the apparent positions of seventeen northern and eighteen southern circumpolar stars arranged in the order of their right ascensions. The mean solar time of transit is given in the column *Washington Mean Time*, in order that each transit above

and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 232 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit of July 1 precedes the upper one, which occurs July 1.8. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Washington Mean Time*.

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 316-513 contain, for every tenth upper transit at Washington, the apparent places of 790 stars, being all those given in the list of mean places of ten-day stars. The *Washington Mean Time* in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are given at the foot of the page, (1) the seconds of the mean place in both right ascension and declination for the beginning of the year, (2) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 201.

Pages 514-521 contain, for Washington apparent noon, the *Apparent Right Ascension* and *Declination* of the Sun, the *Equation of Time*, and the *Variation per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian*. The last column on each page contains the *Sidereal Time of Mean Noon*.

The *Equation of Time*, *Mean-App.* is the correction to be applied to apparent time in order to obtain mean time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington counted from the nearest noon.

Pages 522-537 contain the *Right Ascension of Center*, the *Geocentric Declination of Center*, the *Sidereal Time of Semidiameter Passing Meridian*, the *Geocentric Semidiameter*, and the *Equatorial Horizontal Parallax* of the Moon, and the *Washington Mean Time* at the moment of each upper and lower transit over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied in each case to the quantity in the preceding column to obtain its value for the time of transit over the meridian one hour west of Washington, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The quantities in the third column, when corrected for another longitude by the hourly variations, give the local mean time of transit for that longitude. By means of the variations per hour of longitude any one of the quantities under consideration can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant

meridians, we may proceed as follows: Let F represent either the *Washington Mean Time*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let V represent the corresponding *Variation per Hour of Longitude*. Write down three successive values of F , together with the corresponding values of V , and difference the latter as in the following scheme, where the middle values, F_0 and V_0 , belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ :—

Function.	Var. per Hour of Longitude.	Δ'	Δ''
F_{-1}	V_{-1}	α'	
F_0	V_0	α''	b
F_{+1}	V_{+1}		

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda V_0 + \frac{\lambda^2}{48} (\alpha' + \alpha'') + \frac{\lambda^3}{864} b$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within $1''$ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a footnote.

Pages 538–554 contain for each of the seven major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semidiameter*, *Sidereal Time of Semidiameter Passing Meridian*, and the *Washington Mean Time*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The stellar magnitude at opposition for Mars, Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Greenwich mean time, except in the case of the occultations visible at Washington, where Washington time is used.

Pages 556–563 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical

diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1917, January 22, begins and ends at Kasan, Russia, latitude $+55^{\circ} 50'$, longitude $-48^{\circ} 49'$.

For the beginning we compare the distance of the place from the curves of 18^h and 19^h , and find it to correspond to about 40 minutes from the former, thus giving for the approximate time of beginning $18^h 40^m$; for the end we compare the distance of the place from the curves of 20^h and 21^h , and find it to be about 50 minutes from the former, thus giving for the approximate time of ending $20^h 50^m$, and both of these results are probably correct to within 1 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning.	Ending.
		d h m	d h m
Greenwich mean time	January	22 18 40	22 20 50
Longitude east		3 15	3 15
Local mean time	January	22 21 55	23 0 5

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relative to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy . We take the intersection of this plane with that of the Earth's equator as the axis of x , and the center of the Earth as the origin of coordinates. The axis of y is perpendicular to that of x , and directed toward the north; x and y are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d , of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2 , the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x' , y' , and μ' , which are the changes of x , y , and μ , in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:

(1) The coordinates of the observer, ξ , η , and ζ , together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, $1/297$, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.	Log G.
0°	0.00000 1	0.00293 1
5	0.00001 2	0.00292 2
10	0.00004 6	0.00289 6
15	0.00010 7	0.00283 7
20	0.00017 9	0.00276 9
25	0.00028 11	0.00267 11
30	0.00037 11	0.00256 11
35	0.00048 12	0.00245 12
40	0.00060 12	0.00232 12
45	0.00073 12	0.00220 12
50	0.00086 12	0.00207 12
55	0.00098 12	0.00195 12
60	0.00110 10	0.00183 10
65	0.00120 9	0.00178 9
70	0.00129 8	0.00164 8
75	0.00137 5	0.00156 5
80	0.00142 3	0.00151 3
85	0.00145 1	0.00148 2
90	0.00146	0.00146

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ . Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$

$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\begin{aligned}\xi' &= [7.63992] \rho \cos \phi' \cos (\mu - \lambda) \\ \eta' &= [7.63992] \rho \cos \phi' \sin d \sin (\mu - \lambda) = [7.63992] \xi \sin d \\ \xi' &\text{ is not needed.}\end{aligned}$$

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y' , and their logarithms are given beneath the tables of x and y .

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N , are computed by the formulæ—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) Both for the shadow and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formulæ—

$$L = l - \zeta \tan f$$

l and f being taken from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ϕ from the equation—

$$\sin \phi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when $\sin \phi$ is positive, and one in the third and the other in the fourth quadrant when $\sin \phi$ is negative; but simplicity will be gained by taking only that value of ϕ for which $\cos \phi$ is positive. This value lies between the limits $+90^\circ$ and -90° . The correction τ to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} \mp \frac{L \cos \phi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of τ can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning and the other near the ending of the eclipse, both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of τ which, when applied to the assumed time, will give

the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly, the computation for the second assumed time will give a small and nearly correct value of τ for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of τ , which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of τ in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau(l' + [5.3100]\xi \cos d)}{n \cos \psi} - \frac{[4.9788]\tau^2}{n \cos \psi} [\xi \sin(N \mp \psi) - \eta_2 \cos(N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending. l' is the variation of l for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of τ_0 are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

Position-angle of Point of Contact.—The position-angle P , of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formulæ—

$$P = N - \psi \pm 180^\circ \text{ for the beginning,}$$

$$\text{or } P = N + \psi \quad \text{for the ending,}$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90^\circ$.

Computation of the Solar Eclipse of 1917, January 22, for Kasan, Russia.

The position of Kasan is—

$$\begin{aligned} \text{Latitude, } \varphi &= +55^\circ 50' 20'' \\ \text{Longitude, } \lambda &= -48^\circ 49' 8'' \end{aligned}$$

and its geocentric coordinates are—

$$\begin{aligned} \rho \sin \varphi' &= 9.91582 \\ \rho \cos \varphi' &= 9.75037 \end{aligned}$$

From the Eclipse Chart we find the approximate times of the phases to be—

Beginning	January 22	d 18	m 40	} Greenwich Mean Time.
Ending	22	20	50	

	T	Jan. 22,	Beginning. 18 ^h 40 ^m	Ending. 20 ^h 50 ^m
			° ' "	° ' "
μ			277 1 42	309 31 30
λ			- 48 49 8	- 48 49 8
$\mu - \lambda$			+325 50 50	+358 20 38
$\rho \cos \varphi$			9.75037	9.75037
$\sin (\mu - \lambda)$			9.74927 n	8.46091 n
$\log \xi$			9.49964 n	8.21128 n
ξ			-0.31597	-0.01627
$\rho \sin \varphi$			9.91582	9.91582
$\cos d$			9.97417	9.97423
$\log \eta_1$			9.88999	9.89005
η_1			+0.77623	+0.77633
$\rho \cos \varphi$			9.75037	9.75037
$\sin d$			9.52487 n	9.52445 n
$\cos (\mu - \lambda)$			9.91780	9.99982
$\log \eta_2$			9.19304 n	9.27464 n
η_2			-0.15597	-0.18821
$\eta = \eta_1 - \eta_2$			+0.93220	+0.96454
$\rho \sin \varphi \sin d$			9.44069 n	9.44027 n
ζ_1			-0.27586	-0.27559
$\rho \cos \varphi \cos d \cos (\mu - \lambda)$			9.64234	9.72442
ζ_2			+0.43887	+0.53018
$\zeta = \zeta_1 + \zeta_2$			+0.16301	+0.25459
const. log.			7.63992	7.63992
$\rho \cos \varphi \cos (\mu - \lambda)$			9.66817	9.75019
$\log \xi'$			7.39999	7.39911
ξ'			+0.002033	+0.002455
const. log.			7.63992	7.63992
$\xi \sin d$			9.02451	7.73573
$\log \eta'$			6.66443	5.37565
η'			+0.000462	+0.000024
$x - \xi$			-0.49777	+0.39785
$y - \eta$			+0.00719	+0.38000
$x' - \xi'$			+0.007163	+0.006739
$y' - \eta'$			+0.002652	+0.003095
$m \sin M$			9.69703 n	9.59972
$m \cos M$			7.85673	9.57978
$\tan M$			1.84030 n	0.01994
M			270° 49' 39"	46° 18' 54"
$\sin M$			9.99995 n	9.85923
$\log m$			9.69708	9.74049
$n \sin N$			7.85509	7.82860
$n \cos N$			7.42357	7.49066
$\tan N$			0.43152	0.33794

	Beginning.	Ending.
N	$69^{\circ} 41' 2''$	$65^{\circ} 19' 58''$
$\sin N$	9.97210	9.95844
$\log n$	7.88299	7.87016
$\tan f$	7.67665	7.67664
$\log \zeta$	9.21222	9.40584
	6.88887	7.08248
$\zeta \tan f$	+0.00077	+0.00121
l	+0.53797	+0.53792
L	+0.53720	+0.53871
$M-N$	$201^{\circ} 8' 37''$	$340^{\circ} 58' 58''$
$\sin (M-N)$	9.55715 n	9.51302 n
$\log m$	9.69708	9.74049
$\text{colog } L$	0.28086	0.27026
$\sin \psi$	9.52409 n	9.52378 n
ψ	$-19^{\circ} 31' 40''$	$-19^{\circ} 30' 48''$
$\log \frac{m}{n}$	1.81409	1.87033
$\cos (M-N)$	9.96973 n	9.97563
	1.78382 n	1.84596
$\frac{m}{n} \cos (M-N)$	+60.789	-70.139
$\log L$	9.73014	9.72974
$\cos \psi$	9.97427	9.97431
$\text{colog } n$	2.11701	2.12984
	1.82142	1.83389
$\mp \frac{L \cos \psi}{n}$	-66.236	+68.217
r	$\frac{m}{-5.497}$	$\frac{m}{-1.922}$
$T+r$	$\frac{d}{22} \frac{h}{18} \frac{m}{34.503}$	$\frac{d}{22} \frac{h}{20} \frac{m}{48.078}$

Since the value of r for the beginning is rather large, we compute the correction δr for this phase as follows:

	Beginning.		Beginning.
const. log	5.3100	$\cos (N-\psi)$	8.1358
$\log \xi$	9.4996 n	$\log \eta_2$	9.1930 n
$\cos d$	9.9742	$\log \eta_2 \cos (N-\psi)$	7.3288 n
	4.7838 n		
number	-0.0000061	$\xi \sin (N-\psi)$	-0.3180
r	0.0000000	$\eta_2 \cos (N-\psi)$	-0.0021
sum	-0.0000061	diff.	-0.3139
$\log (\text{sum})$	4.7838 n	$\log (\text{diff.})$	9.4968 n
$\log (-r)$	0.7401	const. log	4.9788 n
$\text{colog } n$	2.1170	$\log r^2$	1.4802
$\sec \psi$	0.0257	$\text{colog } (n \cos \psi)$	2.1427
	7.6666 n		8.0985
(1)	-0.0046	(2)	+0.0125
$N-\psi$	$89^{\circ} 13'$	$\frac{m}{(1)+(2)=\delta r}$	+0.0079
$\sin (N-\psi)$	0.0000	r	-5.497
$\log \xi$	9.4996 n	r_0	-5.489
$\log \xi \sin (N-\psi)$	9.4996 n		

The corrected time of beginning is, therefore,

$$T_0 = \text{January } 22^{\text{d}} 18^{\text{h}} 34^{\text{m}}.511$$

Whence we find—

	Beginning.	Ending.
	d h m	d h m
Greenwich Mean Time, January	22 18 34.511	22 20 48.078
λ	- 3 15.276	- 3 15.276
Local Mean Time, January	22 21 49.787	23 0 3.354

Therefore we have—

Beginning of the Eclipse, January	d h m s	Local Mean Time.
End of the Eclipse, January	23 0 3 21.2	
	Beginning.	Ending.
$N - \phi$	89 12.7	45 49.1
constant	180 0.0	0 0.0
Angle of position, P	269 12.7	45 49.1

from the north point of the Sun's disk toward the east for direct image.

Pages 564–568 contain the adopted mean places and annual proper motions of such stars, as bright as magnitude 6.5, as will be occulted during the year by the Moon.

Pages 569–610 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1917.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1917 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T , at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Greenwich—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the time of immersion and emersion of a star relative to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H - \lambda$ or $T - \lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Greenwich mean time;

H = the Greenwich west hour-angle of the two bodies at that moment;

λ = the longitude west of Greenwich;

$h_0 = H - \lambda$ = the local hour-angle of the star at the instant T ;

δ = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 724.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t . It will have the same sign as h_0 .

When DOWNES's table is not available, the correction may be computed from the formulæ—

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192] \rho \cos \varphi' \cos \frac{4}{3} h_0$$

$$t = \frac{\xi_0}{\xi' - \xi_0}$$

By applying t to the Greenwich mean time of geocentric conjunction, as given with the elements, we shall have the Greenwich mean time of local conjunction within a few minutes.

(2) Compute for the instant $T+t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t :

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (\lambda_0 + t_0) \\ \eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (\lambda_0 + t_0) = \eta_1 - \eta_2 \\ \xi' &= [9.4192] \rho \cos \varphi' \cos (\lambda_0 + t_0) \\ \eta' &= [9.4192] \rho \cos \varphi' \sin \delta \sin (\lambda_0 + t_0) = [9.4192] \xi \sin \delta \\ x &= x't \\ y &= Y + y't\end{aligned}$$

Compute also m , M , n , N , and ψ from the equations,

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta' \\ \sin \psi &= [0.5646] m \sin (M - N)\end{aligned}$$

ψ being taken between the limits $\pm 90^\circ$. Finally compute,

$$\begin{aligned}\tau &= -\frac{[1.7762]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi \\ \delta\tau &= \frac{[6.7501]r^2}{n \cos \psi} [\eta_1 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]\end{aligned}$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated, respectively, τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Greenwich mean times of the phases,

$$\begin{aligned}\text{Instant of immersion} &= T + t + \tau' + \delta\tau' \\ \text{Instant of emersion} &= T + t + \tau'' + \delta\tau''\end{aligned}$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results it will be advisable to compute ξ , η , x , and y for the times of immersion and emersion finally obtained. If these times are correct, the quantities in question will fulfill the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2725$$

If $\log m \sin (M - N) > 9.4354$, $\sin \psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semi-diameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P . It is computed from the formulæ—

$$\begin{aligned}P &= N - \psi + \delta P && \text{for immersion,} \\ \text{or } P &= N + \psi + \delta P \pm 180^\circ && \text{for emersion,}\end{aligned}$$

where the angles $N-\phi$ and $N+\phi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp \frac{[7.3038]r^2}{\cos \phi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V , is also reckoned in the direction from the north toward the east, and is found from the formula

$$V = P - C$$

where C is computed from the expression,

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]r^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]r^2\eta},$$

C being taken less or greater than 180° , according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4700 to 6300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of 89 B. Leonis on March 6, 1917, for Evanston, Ill., whose position is—

$$\begin{aligned}\phi &= +42^\circ \ 3' \ 33''.4 \\ \lambda &= +5^h \ 50^m \ 42^s.3\end{aligned}$$

and whose geocentric coordinates are—

$$\begin{aligned}\rho \sin \phi' &= 9.8237 \\ \rho \cos \phi' &= 9.8713\end{aligned}$$

From the elements on page 576 we have,

$$\begin{aligned}T &= 17^h \ 10^m \\ H &= +6^h \ 13.6 \\ h_0 &= H - \lambda = +0^h \ 22.9\end{aligned}$$

and

From the formulæ on page 730, we find the correction, t , to the Greenwich mean time of geocentric conjunction, T , to be about $+0^h \ 14^m.4$; therefore the Greenwich mean time of apparent conjunction is—

$$T + t = \text{March } 6^d \ 17^h \ 24^m.4$$

89 B. Leonis.	Apparent Declination..	G. M. T. of \diamond	Hour Angle.	χ	τ	ν
	d h m	d h m	d h m			
	+8 42.4	Mar. 6 17 10.0	+6 13.6	+0.7506	0.5032	-0.2220

$T+t$	Mar. 6 ^d 17 ⁿ 24 ^m 4	$x-\xi$	+0.0003
λ_0	+ 0 22.9	$y-\eta$	+0.1497
t_0	+ 0 14.4	$x'-\xi'$	+0.3106
λ_0+t_0	+ 0 37.3	$y'-\eta'$	-0.2268
$\rho \cos \varphi'$	9.8713	$m \sin M$	6.4771
$\sin (\lambda_0+t_0)$	9.2096	$m \cos M$	9.1752
$\log \xi$	9.0809	$\tan M$	7.3019
ξ	+0.1205	M	0° 7'
$\rho \sin \varphi'$	9.8237	$\cos M$	0.0000
$\cos \delta$	9.9950	$\log m$	9.1752
$\log \eta_1$	9.8187	$n \sin N$	9.4922
η_1	+0.6587	$n \cos N$	9.3556 n
$\rho \cos \varphi'$	9.8713	$\tan N$	0.1366 n
$\sin \delta$	9.1801	N	126° 8'
$\cos (\lambda_0+t_0)$	9.9942	$\sin N$	9.9072
$\log \eta_2$	9.0456	$\log n$	9.5850
η_2	+0.1111	const. log	0.5646
$\eta_1-\eta_2=\eta$	+0.5476	$\log m$	9.1752
const. log	9.4192	$\sin (M-N)$	9.9079 n
$\rho \cos \varphi' \cos (\lambda_0+t_0)$	9.8655	$\sin \phi$	9.6477 n
$\log \xi'$	9.2847	ϕ	-26° 23'
ξ'	+0.1926	const. log	1.7782
const. log	9.4192	$\log \frac{m}{n}$	9.5902
$\xi \sin \delta$	8.2610	$\cos (M-N)$	9.7694 n
$\log \eta'$	7.6802		1.1378 n
η'	+0.0048	$-\frac{[1.7782]m}{n} \cos (M-N)$	+13.73
$\log x'$	9.7018	const. log	1.2135
$\log z$	9.3802	colog n	0.4150
$\log x$	9.0820	$\cos \phi$	9.9522
x	+0.1208		1.5807
$\log y'$	9.3464 n	$\mp \frac{[1.2135] \cos \phi}{n}$	∓ 38.08
$\log y/t$	8.7266 n	τ for immersion	-24.35
y/t	-0.0533	τ for extinction	+51.81
Y'	+0.7506		
y	+0.6973		

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \phi$	152° 31'	99° 45'
$\cos (N \mp \phi)$	9.9480 n	9.2288 n
$\log \eta_2$	9.0456	9.0456
$\log (1)$	8.9936 n	8.2744 n
(1)	-0.0985	-0.0188
$\sin (N \mp \phi)$	9.6642	9.9937
$\log \xi$	9.0809	9.0809
$\log (2)$	8.7451	9.0746
(2)	+0.0556	+0.1187
(1)-(2)	-0.1541	-0.1375
$\log [(1)-(2)]$	9.1878 n	9.1383 n
const. log	6.7591	6.7591
$\log \tau^2$	2.7730	3.4288
colog ($n \cos \phi$)	0.4628	0.4628
$\log \delta\tau$	9.1827 n	9.7890 n

		Immersion.			Emerison.	
		m			m	
δr		- 0.15			- 0.62	
$r + \delta r$		- 24.50			+ 51.19	
$T + t$		d	h	m	h	m
Mar.		6	17	24.4	17	24.4
Greenwich Mean Time of Phase,		6	16	59.9	18	15.6
λ		+ 5 50.7			+ 5 50.7	
Evanston Mean Time		Mar.	6	11 9.2	12	24.9
To find δP and P :						
$\log \eta_2$ 9.0456		$\log \xi$ 9.0809	(3) +0.0897			
$\sin N$ 9.9072		$\cos N$ 9.7706 n	(4) -0.0710			
$\log (3)$ 8.9528		$\log (4)$ 8.8515 n	(3) + (4) +0.0187			
		Immersion.			Emerison.	
$\log [(3) + (4)]$		8.2718			8.2718	
const. log		7.3038 n			7.3038	
$\log r^2$		2.7730			3.4288	
$\colog \cos \phi$		0.0478			0.0478	
$\log \delta P$		8.3964 n			9.0522	
δP		0.0			+0.1	
$N \mp \phi$		152.5			99.8	
constant		0.0			180.0	
Angle of position, P		152.5			279.9	

from the north point of the Moon's limb toward the east, for direct image.

Pages 611-613 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 614 contains the *Ephemeris for Physical Observations of the Sun*.

Page 615 contains certain elements referring to the Moon, its equator, and its orbit.

i = the inclination of the Moon's mean equator to the Earth's true equator.

Δ = the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic of date.

Ω' = the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator.

P = the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

Ω = the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

C = the Moon's mean longitude, referred to the mean equinox of date.

Pages 616-623 contain the *Ephemeris for Physical Observations of the Moon*. The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xiii, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° - longitude) and latitude and the position-angle of the Moon's axis, C , in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is the region thus exposed to view is on the north limb.

The altitude of the Sun, A , at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β , are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by l_{\odot} and b_{\odot} , respectively:

$$\sin A = \sin b_{\odot} \sin \beta + \cos b_{\odot} \cos \beta \cos (l_{\odot} - \lambda)$$

Pages 624–625 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360° . We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 626–627 contain the *Ephemeris for Physical Observations of Mars*. The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P = the position-angle of the axis of rotation measured eastward from the north point of the disk.

A_{\oplus}, A_{\odot} = the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

D_{\oplus}, D_{\odot} = the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

\odot_{\oplus} = the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i = the angle between the Sun and the Earth as seen from the planet.

g = the angular value of the greatest defect of illumination as seen from the Earth.

Q = the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the Greenwich Mean Time of every transit of the zero meridian across the actual center of the disk.

Pages 628–631 contain the *Ephemeris for Physical Observations of Jupiter*.

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Greenwich mean time of every fifth transit of the zero meridian across the center of the illuminated disk.

The quantities in the remaining columns on pages 628-629 are the same as those defined under the *Ephemeris for the Physical Observations of Mars*.

Pages 632-657 contain, concerning the *Satellites of Jupiter*, the diagram of the orbits of Satellites I-V, the times of conjunction of Satellites I-IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of the Satellites I-IV together with their configurations.

Page 658 contains the *Magnitude of Saturn* and the *Elements of the Rings*.

a, b = the major axis and minor axis, respectively, of the outer ellipse of the outer ring.

P = the position angle of the northern semi-minor axis of the rings, measured from the north, positive towards the east.

B = the Saturnicentric latitude of the Earth referred to the plane of the rings, positive towards the north.

$U+180^\circ$ = the Saturnicentric longitude of the Earth measured in the plane of the rings from their ascending node on the Earth's equator.

ω = the distance in the plane of the rings from their ascending node on the Earth's equator to their ascending node on the ecliptic.

B' = the Saturnicentric latitude of the Sun referred to the plane of the rings, positive towards the north.

$U'+180^\circ$ = the Saturnicentric longitude of the Sun measured in the plane of the rings from their ascending node on the ecliptic.

Pages 659-667 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phoebe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 668 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 669-670 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 671 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 672-673 contain the *Phenomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page xx. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0° , $\pm 90^\circ$, or 180° . For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, $\delta \ \delta \ \subset \dots \delta - 4^\circ 22'$ would be read "Conjunction of Mars with the Moon, Mars $4^\circ 22'$ to the South."

These pages contain also the beginning of the seasons; the perihelia and aphelia of the planets, including the Earth; the passage of the planets through the nodes of their orbits upon the ecliptic; and the date of lunar and solar eclipses, with their aspect as seen from Washington.

Pages 674–683 contain the *Positions of Observatories*, together with a list of the authorities from which the positions are obtained. The tabular arrangement is self-explanatory.

Page 684 contains two examples in the computation of lunar distances, which are inserted because lunar distance tables are no longer published.

Pages 685–709 contain a series of tables numbered from I to VII.

Table I—For Finding the Latitude by an Observed Altitude of *Polaris*.

Table II—For converting *Sidereal into Mean Solar Time*.

Table III—For converting *Mean Solar into Sidereal Time*.

Table IV—For Finding the *Azimuth of Polaris at All Hour Angles*.

Table V—For Finding the *Azimuth of Polaris at Elongation*.

Table VI—For Finding the Times of Upper and Lower Culmination of *Polaris*.

Table VII—For finding the *Apparent Place, Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation*, of *Polaris*.

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μ 323	δ 472	ν 337		α 420	γ 418	τ 329
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θ 396	2 466	η 359	22 H. 369	ζ 490	Cephei.	ζ 234
ι 405	6 467	θ 368	23 H. 372	θ 486	α 489	θ 337
		ι 357	25 H. 233	ι 489	β 491	π 411
Apodis.	Aræ.	λ 361	30 H. 234	μ 493	γ 510	
α 432	α 455	μ 360	32 H. 235	π 480	ζ 496	Cæli.
γ 447	β 454	ν 366		ρ 480	η 484	α 356
δ^1 444	δ 455	σ 365	Cancri.	υ 482	θ 481	
θ 425	ϵ^1 451	χ 363		ϕ 483	ι 502	Columbæ.
59 G. 236	θ 461	ϕ^1 370	α 391		κ 479	α 365
		ϕ^2 374	β 386	Carinæ.	ω 506	σ 361
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η 499	η 403	γ 430	σ^2 390	γ 323	43 H. 232	
θ 497	θ 403	δ 437	ω 383	δ 326	47 H. 341	
ι 495	ι 393	ϵ 432	α^1 386	ϵ 330	48 H. 343	Cor. Austr.
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μ 485	μ 404	θ 429	Can. Maj.	η 322	228 B. 499	
ν 487	ν 373	λ 428	α 374	ι 335	Ceti.	Cor. Bor.
ξ 491	ξ 382	μ 437	β 370	μ 324	α 341	α 439
π 498	π 378	ν^1 439	γ 377	ρ 512	β 321	β 438
σ 498	ρ 384	ρ 430	δ 377	ω 328	γ 338	ϵ 443
τ 501	σ 380	σ 431	ϵ 376	4 507	δ 337	ζ 440
υ 499	τ 375	τ 424	ζ 369	5 H ¹ . 505	ζ 330	σ 445
ϕ 505	υ 396	ϕ 435	η 379	21 321	η 324	
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ω^2 510	χ 383	d 427				

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	τ 361	τ 340	4 382	24 449		β 433
Octantis.	φ^1 364	ν 328	20 385		Trianguli.	γ 437
	11 359	φ 329		Sculptoris.		δ 237
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β 238	Pavonis.	m 354		β 508	β 333	ζ 441
γ^1 238		6 333	α 389	γ 506	γ 334	η 447
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ζ 234	β 483	Phœnicis.	Reticuli.	s 330	Tri. Austr.	4 428
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κ 235	ζ 465	β 324	δ 350		γ 436	Velorum.
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ρ 236	λ 467	s 316	Sagittæ.	β 440	Tucanæ.	
σ 237	Pegasi.	μ 320		γ 442		Virginis.
ν 238		ϕ 331	β 474	s 441	α 497	
χ 237	α 503	Piazzi.	γ 477	η 463	γ 506	α 422
4 G. 232	β 503		δ 476	6 468	ϵ 513	β 412
7 G. 233	γ 317	221 494	Sagittarii.	κ 440	ζ 318	γ 418
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	ζ 500	Pictoris.	γ 461	ξ 457	Ura. Maj.	ϵ 421
α 456	η 500		δ 463	τ^1 438		ζ 423
β 458	θ 496	α 375	ϵ 464	c 465	α 406	η 415
γ 459	ι 495	Pisc. Austr.	ζ 469	3 436	β 408	θ 421
δ 445	λ 501		η 462	Sextantis.	γ 412	ι 428
ϵ 446	μ 501	α 503	ι 477	6 397	δ 414	κ 427
ζ 449	π 496	s 500	λ 465	33 402	ϵ 420	λ 429
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δ 455	31 497	ζ 325	d 471	δ 353	μ 400	χ 418
30 452	55 504	η 327	f 475	ϵ 354	ν 408	m 424
67 461	59 505	θ 508	h 473	ζ 364	o 387	70 423
70 461	70 508	ι 509	54 474	η 348	σ 392	89 425
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